RAILROAD GAZETTE

FRIDAY, MARCH 27, 1896.

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Contributions.

The Railway Signaling Club.

CHICAGO, March 19, 1896.

TO THE EDITOR OF THE RAILROAD GAZETTE:

A year ago, March 11, 1895, the Railway Signaling Club was organized in Chicago. The organization was brought about by a few of the signal men of the railroads running into Chicago, who, realizing the good results of similar technical societies, wished to start a club that would bring together the men interested in railway signaling with the object of "the advancement of knowledge concerning the design, construction, maintenance and operation of railway signaling apparatus. . . . to the end that the practice might be systematized and improved." In starting this club, it was the intention to have papers presented at the meetings and discussed by the members, and it was decided upon from the very first to try and interest all the men who were engaged in this department in order that results would be of such a character that they would command attention and be of recognized value to the railroad world. There were but six charter members of this club, and as little publicity was given to its organization as was consistent with good judgment. The dues were placed at $2 a year, and the membership consisted of three classes—members, associate members and honorary members. The qualifications for active membership are "persons who are or have been connected with the designing, construction, matenance or operation of signals, and in responsible charge thereof upon a railroad, and who have occupied such a position not less than one year, and excepting such persons who are engaged with companies other than railroads in the manufacture and sale of signaling material." Associate members are those who "shall have been engaged in signaling work of the nature of engineering or maintenance for a period of not less than one year, though not necessarily as employees of railways." Both honorary and associate members shall have all the privileges of membership except the right to vote and hold office.

The above limitations for membership have resulted in some little discussion, a few holding to the belief that unless the membership was made broader the revenues would not be sufficient to carry on the club in the proper manner. As it now is, persons engaged with companies manufacturing signaling supplies cannot be active members, and at the first annual meeting of the club last January it was voted to abide by these articles of the constitution. It must not be understood, however, that there is any feeling among the members to exclude the supply men from participation in the meetings of the club; for such is not the case. They are always warmly invited to come and to participate in the discussions and the right of associate membership is gladly extended. The reasons for not granting full membership are such as will readily be seen to be just, considering the present status of the club. As it now is, the members have every desire to have their club recognized by officials of the railroads, and it is well known that many of these officials would not regard the club so favorably if they knew that its membership was on such broad lines. But knowing as they now do, that it is to be controlled by strictly railroad men, they will feel more favorably disposed toward it, and give it more encouragement than they otherwise would.

Of course a broader membership would give the club more funds, and the need for sufficient money to successfully carry on such a club is well known, but there seems to be no doubt now that the club is on a solid basis and will show satisfactory progress. The membership has now increased to 33, including several who, though so located as to be unable to attend the meetings regularly, yet desire the privileges of membership for the benefit they will derive from the *Proceedings*. These *Proceedings* are now regularly published and distributed to the members, as are also advance copies of the papers that are to be discussed. The dues have been increased to $3 a year.

The work done by the club during its first year has been of an exceptionally high character. The various papers presented have appeared in the technical papers and it is not necessary to enumerate them. They have all been upon live subjects, and now since the full discussions of them will be printed and distributed the members unable to attend the meetings will obtain full benefit from them. Committees have been appointed to report on the following subjects: "Colored Lights for Night Signaling" and "Rules Governing Operation of Interlocking Apparatus." The Committee on "Colored Lights for Night Signaling" submitted their report at the meeting last week.

The usefulness of this club cannot be doubted, as it is the pioneer in this work, which is now recognized to be of vital importance to the safe movement of trains, especially as the speed of trains is being constantly increased.

SLOW BOARD.

The Cost of Air-Brake Gear.

The Westinghouse Air-Brake Company
NEW YORK, N. Y., March 21, 1896.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In the March 20 number of the *Railroad Gazette*, under the title "The Cost of Air-Brake Gear," is published a communication addressed to the North West Railway Club and signed by officers of the Great Northern Railway. This communication is in the nature of a criticism upon a remark made by the writer, during a topical discussion at the November meeting of the New York Railroad Club. A copy of the communication, above referred to, was handed to the writer, a short time since, by the Secretary of the New York Railroad Club, and was returned to the Secretary, in due course, with a letter explaining the circumstances under which the unfortuuate remark was made. Inasmuch, however, as you have published the communication, the writer feels called upon to explain, through your columns also, the circumstances of the case.

In response to an inquiry from the writer, as to the cost of brake gear furnished in connection with the application of air brakes to the freight cars of an Eastern road, the writer received a letter from the Jackson & Woodin Mfg. Co., naming a price which appeared to the writer, at the time, to cover the cost of the material furnished per car. This letter was received within a day or two of the November meeting of the New York Railroad Club. The price appeared to be a remarkably low one, but the writer had no opportunity, at the time, to analyze the matter. As an illustration of the subject under discussion at the meeting of the New York Railroad Club, i. e., whether it is cheaper for railroads to manufacture supplies, or to purchase them from manufacturing establishments, the writer made, in a general way, a reference to the low price at which the Jackson and Woodin Company was furnishing the Master Car Builders' brake gear. Upon my suggestion to the Jackson & Woodin Co., that the price named by them is exceedingly low, they promptly wrote a second letter, stating that the price named in their first letter was not intended to cover the brake gear complete, but was intended as a price per hundred pounds. Had the writer taken time to determine the weight of the brake gear, it would have been evident to him in the outset, that it would be impossible for any manufacturing concern to furnish the brake gear complete, at a total cost of the sum named in the first letter from the car company.

It must be confessed, therefore, that the statement of the writer above referred to was a careless one, and certainly was a misleading one, though it appeared to the writer at the time that his authority for the statement was not questionable. Upon ascertaining the facts of the case, the writer regretted having made the statement; but, upon reflection, it did not appear to him that the matter was one of sufficient importance to warrant a published explanation, and, as time went on without any criticism of the remark, he felt that a published explanation would have appeared to attach more importance to the influence of the remark than was justified. As the remark seems, from the communication of officers of the Great Northern Railway, to have given annoyance to some, the writer now regrets that he did not promptly attempt an explanation of the misapprehension under which he made the unfortunate statement.

In view of the cost of manufacture of certain brake material, announced in the communication from the officers of the Great Northern, there would appear to be some misunderstanding as to what may properly be called M. C. B. standard freight brake gear. The writer had in mind that standard brake gear shown in detail on Plate 9 of the Report of the Proceedings of the M. C. B. Association for 1895, and the material shown in this plate he understands to be what is commonly known as the M. C. B. standard freight brake gear.

The price given in the communication from the Great Northern is $28.68, but it includes also brake beams and probably some other material than that included in what I understand to be known as the M. C. B. standard freight brake gear. If the brake beams, included in this estimate of the Great Northern, are of any of the well known metallic patterns, which fulfill the specifications of the M. C. B. Association, the cost of the M. C. B. brake gear would, under this estimate, certainly be reduced to a very moderate figure; but the communication does not appear to warrant a conclusion that the brake beams included in the estimate fulfill the specifications of the M. C. B. Association.

It would be interesting to learn the cost to the Great Northern of the forgings, complete, of Plate 9 of the last report of the M. C. B. Association, having the dimensions there given, with holes drilled and pins turned, as the specifications contemplate, and as, of course, the Great Northern presumably does this work. The writer is under the impression that the estimate furnished by the Great Northern officials would, if cut down by the elimination of brake beams and other material than the forgings above referred to, still remain considerably above the price at which those forgings can be purchased in the market, at least in the eastern part of the country.

The writer would not hesitate to concur with that statement of the communication which implies that, if a railroad company is properly equipped to make its own air-brake forgings, it can do so as cheaply as any manufacturing concern could supply them; but, as railroad shops are generally equipped, and in view of the limited amount of such work that each road has to do on its own account, the question is an entirely different one. If to the cost of labor and material be added a reasonable percentage for superintendence, interest upon cost of machinery, deterioration and repairs of same, taxes, etc., the writer is convinced that it will generally be found that a railroad can save a considerable percentage of the cost of manufacturing its air-brake forgings, by purchasing them from those who make that class of work their special business.

R. A. PARKE.

Every Passenger Would Approve it.

NEW YORK, March 23, 1896.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The way of the transgressor is hard—generally, and the way of the reformer is hard—generally.

The transgressor's way is hard because everybody whose rights are transgressed is against him; and the reformer's way is hard because he usually desires something the accomplishment of which would interfere with the fancied rights of a more or less numerous faction.

If I travel in a car whose ventilation is imperfect, and request an addition to the supply of fresh air, I am sure to be met with the statement that a delicate old gentleman already has complained of the draft; or if I object to the flow of dust and cinders from the window in front of me, it is certain that the fresh air fiend will insist upon keeping it open.

Many an ambition for the good of the community is thus brought to an untimely end because the community is not unanimous in desiring it. But I have now a cause of complaint and a desire for reform in which I am joined by everyone I know and by countless railroad passengers whom I don't know. Were it otherwise, I would write to the newspapers and work up a popular demand; as it is I write to the *Railroad Gazette* and am certain that when my complaint is seen by the proper officers its cause will vanish.

I lately took a somewhat extended railroad journey, and while no one could desire anything more comfortable or luxurious in travel than the warm, roomy, noiseless, easy-rolling palace in which I rode—unless it were a car in which louts were not permitted, at any price, to put their feet upon the cushions—my ideas of accomplished elegance were rudely disturbed when, upon visiting the urinal, my nostrils were assailed by an odor unworthy of such a car. It is bad enough to find these evidences of uncleanliness in cheaper places, and we have been accustomed so long to the smells of the toilet rooms of ordinary cars and railroad stations that we have became tolerant, perhaps, of the want of water, of disinfectant and of *attention* which makes them possible; but I maintain, sir, that it ought not so to be.

In a private house one finds no such smells, and why should they be so prevalent in cars, stations and ferry houses? If it is said that frequent use causes the trouble, sufficient refutation is found in the condition of similar rooms in all good hotels. It is difficult, and may be impossible, to carry on a train sufficient water to keep the basins beneath the seats perfectly clean and the urinals free from salts left by evaporation, but this does not apply to stations and it does seem that such a combination of water, disinfectant *and* care might be devised for both as to improve very materially the present conditions.

Is it necessary to call to the attention of any that several of the more dangerous diseases—typhoid fever, etc.—are propagated more surely by such neglect than by any other means, and that those who are trusted to carry us about owe something to our health and sense of decency in matters not impossible of accomplishment?

C. HERSCHEL KOYL.

The United States Timber Tests.

At a recent meeting of the American Society of Civil Engineers Mr. Walter P. Berg, Principal Assistant Engineer Lehigh Valley Railroad, presented the following letter received by him from Mr. B. E. Fernow, Chief of the Division of Forestry, U. S. Department of Agriculture:

The total number of tests made at the mechanical laboratory to Jan. 31 was 39,437, which during February

will be brought up to about 41,500, when all the material collected will be tested and the work for the present abandoned under the orders of the Secretary of Agriculture. In the above number the moisture determinations which accompany the tests are included, reducing the actual number of mechanical tests to probably 35,000. The material for these tests was specially collected in the woods, comprising 356 trees representing 32 species, mainly of southern growth. The distribution of tests by species stands as follows:

Southern pines (5 species)	20,341	
Northern " (2 ")	1,697	
Bald cypress	4,126	
White cedar	243	
Oregon fir, 10 pieces	276	
		26,683 (conifers)
Gum (red)	867	
Oaks, white (4 species)	4,052	
" black (5 ")	4,301	
Hickory (6 ")	3,011	
Ash (2 ")	714	
Elm (2 ")	409	
		13,354
Total	39,437	

Of northern timbers only the white and Norway pines have been tested in a small way, and of Oregon fir only a few random sticks sent in by an interested party; all others are southern.

Of these tests only a portion, on Longleaf pine, was compiled and worked up in Bulletin 8. There are, however, now the entire data on southern pine worked up in manuscript. The average results will presently be stated in an eight-page circular, the status of the printing fund of the department preventing for the present the issue of a full bulletin. There will then still remain nearly as many data referring to other species undigested.

For the southern pines we may claim to have such a series of data as to make it unnecessary for anybody else to test these timbers again; they cover such a large number under all sorts of conditions that absolute confidence in the reliability of the data for the range of strength in the species should be accorded to them. At the same time the confusion existing in engineers' tables with regard to the kind of pine (names or species) should not be permitted any longer, especially since the various species promiscuously referred to as southern pine, yellow pine, pitch pine, etc., differ up to 20 per cent. in average strength values.

But the mere establishment of the strength values does not exhaust the usefulness of these data; they were to be used, and will be used, if we are permitted, to establish such relationships as will lead to the formulation of *rules of inspection*—the most important object of these investigations—as a result of which the engineer or other consumer will be enabled to judge of the comparative value of the piece in hand. . . . .

One of the investigations of this nature directly interesting to the engineer is that on the relation of tests on large and small sizes. Here, too, our number of tests is still too small for safe generalization, although not less than 340 large columns and beams have been tested, with the interesting and readily explained result that for symmetrically cut beams (heart in center) the values are as large and sometimes larger than for the average of the small pieces cut from the same beams; while the columns give mostly but not always lower values, yet the results are so variable that no trustworthy numerical data have been attained, the range in individual cases being as much as 50 per cent.

At present the work will be abandoned for the fiscal year, the allotment of funds having been exhausted, about $40,000 in all having been spent so far. An attempt to work up the test results, at least for data of strength, will be made. In the reading of the appropriations for this division for the next year the reference to this line of work has been left out and a discontinuance is probably contemplated. A bill making special appropriation for its continuance has been introduced in the Senate (S. 1214), but its passage is exceedingly questionable.

Proposed Southern Union Station in Boston.

The negotiations looking to a union of the four railroad terminals in the southern part of the city of Boston, which have been the subject of rumors for several months, and which were briefly noticed in the *Railroad Gazette* of Jan. 24, have suddenly opened out into a definite plan, which was given to the public by the New York, New Haven & Hartford last week; and the elaborate guessing of the Boston *Herald* seems to have been inspired from some source of more account than the commonplace brains of the reporters. The plan is, in brief, to build a magnificent station at the foot of Summer street, to which tracks will be extended for the use of all the roads. The present Summer street station, the terminal of the New England road, will be torn down and the ground occupied by it will be a mere fraction of that to be covered by the new station. The shape, size and location of the proposed station is shown in the accompanying sketch, Fig. 1, and the location of the existing stations, as well as of other prominent points in the city, is shown in the outline sketch of the city, Fig. 3. The mayor of Boston joined the officers of the road in working out the scheme, and a bill providing the necessary legislation was presented by him to a committee of the State Legislature last week. The New Haven officials have given to the newspapers an outline of their plans as follows:

Neither the Park Square Station nor the two stations on Knæland street afforded space enough for a union station for all the lines. The ground occupied by the New England Station at the foot of Summer street had always been passed by in consideration, but finally it suddenly appeared to some of the railroad men considering the problem that the site of the New England station could be satisfactorily enlarged at less cost than any other site that had been named, while, at the same time, it would bring the terminal station nearer to the heart of the city.

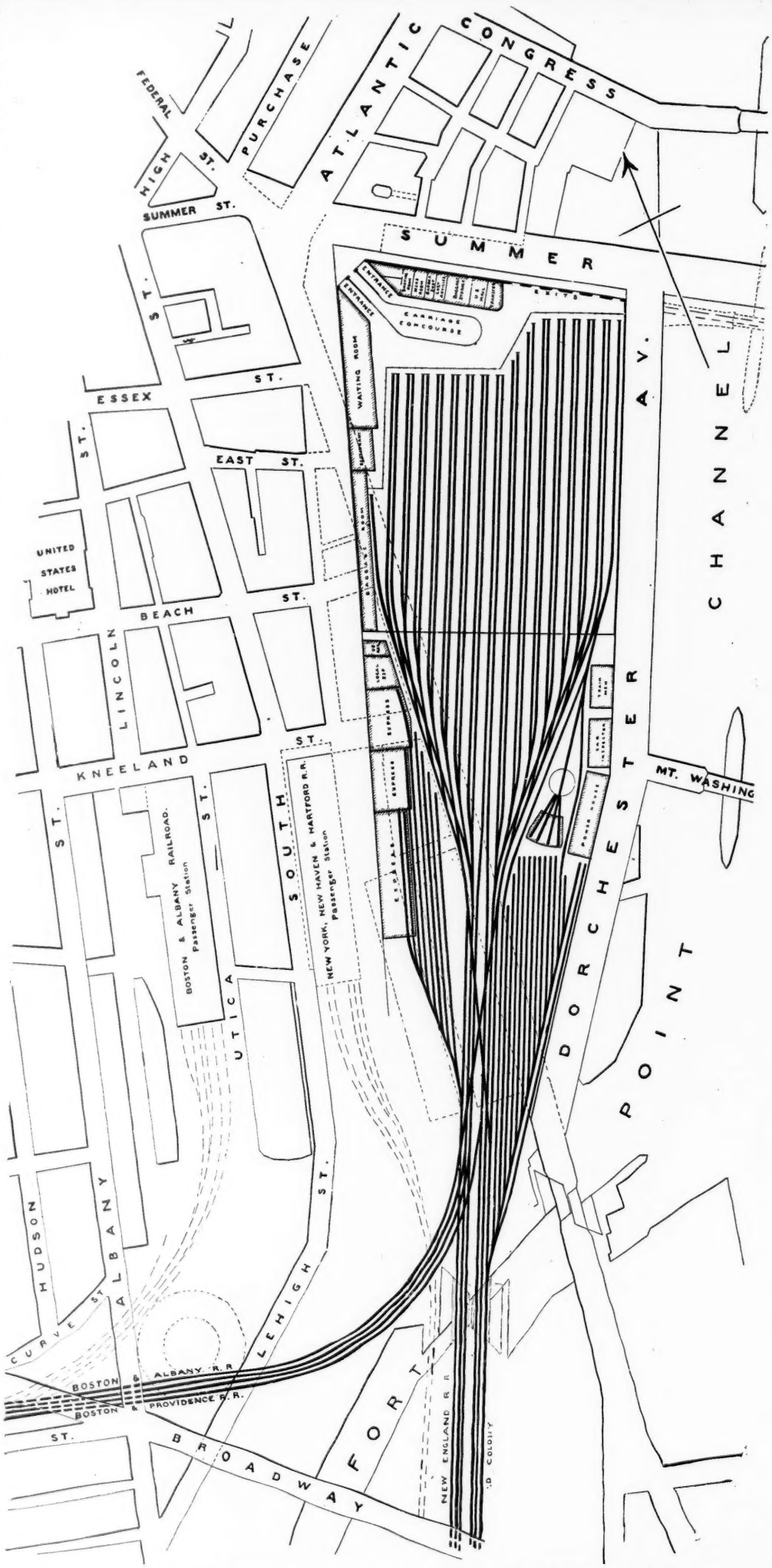


Fig. 1.—Proposed New Passenger Station at Summer Street, Boston; Plan of Tracks and Headhouse.

The scheme, in brief, is as follows: To discontinue Federal street south of Summer street; to make a new street whose west line will be the west line of the present narrow Cove street, extended to the foot of Summer street, this new Cove street to be 100 ft. wide from Summer to Kneeland street; Summer street to be extended eastward by the present ground of the New England Station to Fort Point Channel, this street also to be 100 ft. wide; from the east end of this street another street 100 ft. wide will run southerly close to the line of the channel to old Federal street. This street will be, in effect, when completed, an extension of Dorchester avenue to Summer street, and will form a new thoroughfare to South Boston, in place of Federal street, to be interrupted.

These three wide streets will bound on three sides the

new union station, giving a plot about 600 ft. wide from east to west and as long as it may be necessary to have it from north to south. Mt. Washington avenue and other small passageways will be closed.

Plans have been made for a station, four stories high, for several hundred feet on each side of the angle front facing the open space at the foot of Summer street, This space is to be somewhat enlarged from its present dimensions. The grand entranceway will be on this corner, and the principal waiting rooms, restaurant, baggage room, etc., will extend along the new Cove street. It is proposed to have wide openings for carriages, so that they can be driven directly into the station. The dimen-

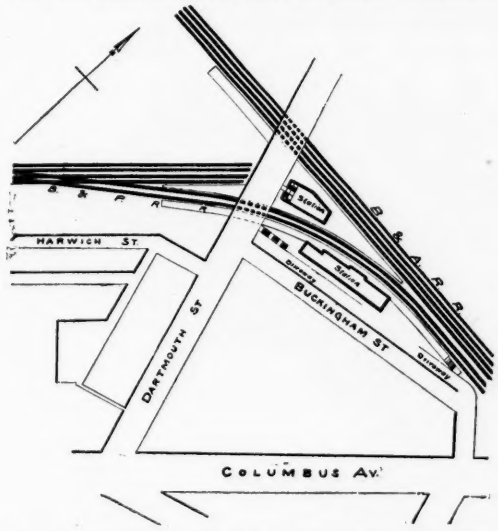


Fig 2.—Proposed Location of New Station, Dartmouth and Buckingham Streets and Columbus Avenue.

sions of the station will permit 33 tracks to be laid in it. The Union station on the north side contains 23 tracks. The present passenger tracks of the New England road, entering from the east over Fort Point Channel, will be discontinued, and the New England tracks will come in parallel with the Old Colony tracks from near the point in South Boston where these roads now cross.

The grade crossing of the Boston & Albany and the Providence division at Dartmouth street will be abandoned forever. The tracks of the Providence division will join those of the Boston & Albany leading into the city and the trains of the two roads will run on the same tracks from the junction to the new station. At the junction of the Boston & Albany and the Providence division tracks will be built a new station, extending from Dartmouth street to Columbus avenue. This station will be completely equipped and will be more convenient to the South End and Park Bay than the present station in Park Square and is intended as a substitute for that station. The street car lines upon Columbus avenue and Dartmouth street will facilitate reaching any part of the city from this point. It is intended to have carriageways graded to the level of the station.

The present Old Colony passenger station will be abandoned. It will be needed by the Boston & Albany for freight yards, and that company intends to turn its present passenger house into the freight service. The freight business of the Old Colony division and the Providence division will be done on the spacious grounds of the New England at South Boston.

The terminal station is to be built, if the legislature passes the bill, by a new corporation called the Boston Terminal Company, all the stock of which will be held by the railroad companies interested in the station. [New Haven and controlled roads four-fifths, Boston & Albany one-fifth.]

The main advantages of this site at the foot of Summer street are that the necessary space can be procured there, and the necessary spaciousness of streets surrounding such a structure can be there established, as neither condition could be met anywhere else. Furthermore, this site is nearer to the business center than any other procurable site. It is also nearer to the Union station on the north side. It is convenient to all the lines of water communication through the harbor.

Preliminary drawings for the new station building have been made by Shepley, Rutan & Coolidge, who designed the new Union station at the North end, and the Boston papers print rough reproductions of the perspective sketch. As will be seen from the ground plan, the angle at the junction of the two streets is to be cut off, making here an elevation 100 ft. long, facing directly toward Federal street. This elevation marks the principal entrance to the building and is treated with a tower 140 ft. high, in which is to be a clock having a face 20 ft. in diameter. On the new Cove street the main building will extend 400 ft. from the corner of Summer street, with restaurant and baggage room extending beyond this main building 600 ft. On Summer street the building will set back 20 ft. from the lot line. This space (from the face of the building to the lot line) will be a covered way, built of iron, with a glass roof, the sidewalk not being included. This covered way will be carried across the principal entrance, and on Cove street will be carried the full length of the main building and for some distance beyond. On this side it will be built over the sidewalk.

The building is to have a granite base, and above the base is to be built of brick and sandstone, with a hip roof covered with copper. It will be four stories high. The first story is to be 30 ft. high. The trainhouse, spanned by two immense arches, will be 610 ft. wide by 825 in length, and contain 33 tracks.

The general waiting room will be 75 ft. wide, 300 ft. long and 30 ft. high. It will have three entrances from Cove street and one through a passageway from the main entrance. Opposite the entrances from Cove street will be doors leading to the trainhouse. The room is to be divided into alcoves about 15 ft. wide, to be arranged with seats on three sides.

According to the estimates of the *Herald*, the ground, now covered with factories and dwellings, will cost $4,000,000, the assessed valuation being nearly two millions; and the city will have to spend about $1,500,000 or $2,000,000 in widening streets and building new bridges. Summer steeet would be extended to South Boston and the bridges over the Boston & Albany at Broadway and Albany street would have to be lengthened. The Boston & Albany proposes to give up its right of way across Kneeland street, leading to the old passenger station, now used by the express companies, and it is probable that the Park square station will be no longer needed for railroad purposes.

The newspapers publish an estimate of the amount of business now done at the existing stations, and the probable amount at the new station, daily, as follows:

	Trains.	Passengers.
Park Square	185	30,000
Boston & Albany	194	37,000
Old Colony	170	35,000
New England	88	23,000
Proposed Station	637	125,000
Boston & Maine	540	184,000

The size of the new train shed, 600 ft. wide by 825 ft. long, is greater than that of any existing station, the three largest of which are:

	Length, ft.	With, ft.	No. of tracks.
St. Louis	700	606	31
Frankfort-on-the-Main	600	552	18
Boston & Maine, Boston	536	460	23

The Summer street terminal is nearer the conventional center of the city of Boston (City Hall) than any of the other stations, as will be seen by the half-mile circle on our map.

The Question of Large Cars.

In our issue of March 6, page 159, appeared a very full abstract of the report made to the New York Railroad Club by a special committee on the subject of large freight cars. It may be remembered that the main conclusions of that committee were that the existing double standard of box cars, one for light freight and one for heavy, should be done away with; that the storage capacity should be slightly increased; that special sizes for furniture and wagons should not be built; that the maximum outside cross-section should not exceed 12 ft. 3 in. from rail to top of eaves and 9 ft. 10 in. width from out to out; that the inside cross-section should be 65 sq. ft. minimum, 75 sq. ft. maximum; inside length, 34 ft. minimum and 36 ft. maximum; that 40,000-lb. cars should be withdrawn from general interchange service, as should cars of less than 30 ft. length inside and storage capacity less than 1,500 cu. ft.; that a rule to this effect should be added to the M. C. B. Rules of Interchange, and that the maximum trade limit should be 70,000 lbs. for roofed cars and 80,000 for open cars. This report was followed by letters from many different people, a synopsis of which we shall now make:

Mr. R. A. PARKE, Westinghouse Air-Brake Co., discussed the subject from the point of view of braking. Seventy per cent. of the weight of the empty car is the maximum braking force. If the car weighs 25,000 lbs. empty and is loaded with 40,000 lbs. there is 2⅔ times as much moving matter to be resisted when the train is loaded and the effective control is but 38½ per cent. as great. If the car weighs 30,000 lbs. empty and carries 60,000 lbs., the effectiveness of the brakes is but 33⅓ per cent. as great as when the train is empty. Of course this discrepancy would increase as the carrying capacity of the cars is raised.

Mr. E. A. HANDY, Chief Engineer of the Lake Shore, wrote briefly from the point of view of maintenance of track. The weight of cars should be kept down so that in no case will the weight on a given wheel base exceed the weight on a like wheel base of the locomotives used on the road. In fact, he would keep the comparative car weight considerably below that of the locomotive, because with equal weights the cars are liable to do more harm to the track than the locomotive having more flat wheels.

Mr. E. C. LEAVENWORTH, General Freight Agent, Grand Rapids & Indiana, would have a maximum limit of size for large cars. The standard box car on his road to-day is inside 40 ft. 1½ in. long, 8 ft. 6 in. wide and 8 ft. 7 in. high. This permits the handling of many bulky articles at about the classification minimum weights. He considers that it would be an injustice to advance the minimum weights for large cars when a 34-ft. car is taken as a basis. Either a 40-ft car should be taken as a basis or the minimum weights in the classification should be reduced only for certain light and bulky articles, increasing the weights of all commodities loaded in large cars and using a certain percentage for each foot of increase in the length of cars.

Mr. PAUL WADSWORTH, Assistant General Freight Agent, Delaware & Hudson Canal Co., said that to reduce the entire equipment to one standard would cause hauling a much larger percentage of dead weight than to have a double standard of 30,000-lb. and 60,000-lb. cars. The double standard would enable carriers to provide cars better adapted to the requirements of traffic. There is an economic side to the question, viewed from the traffic standpoint. One must consider convenience of loading and unloading, loss from damage resulting from excessive weight of one package on another, etc. To get the best results under a single standard a readjustment of classification would be necessary, which would result in scaling rates to induce shippers to increase their carload shipments. It is a question if in a few years we should not find the revenue from the large cars about the same as that now earned with 30,000-lb. or 40,000-lb. cars. The demands of trade regulate to a very large extent the quantity ordinarily shipped as a carload. If a tonnage standard is maintained a single rule can be inserted in the classification, fixing a percentage basis of increase upon the present minimum, affording proper revenue for hauling large cars and eliminating much of the danger of reduced revenue.

Mr. J. R. CAVANAGH, Superintendent of Car Service

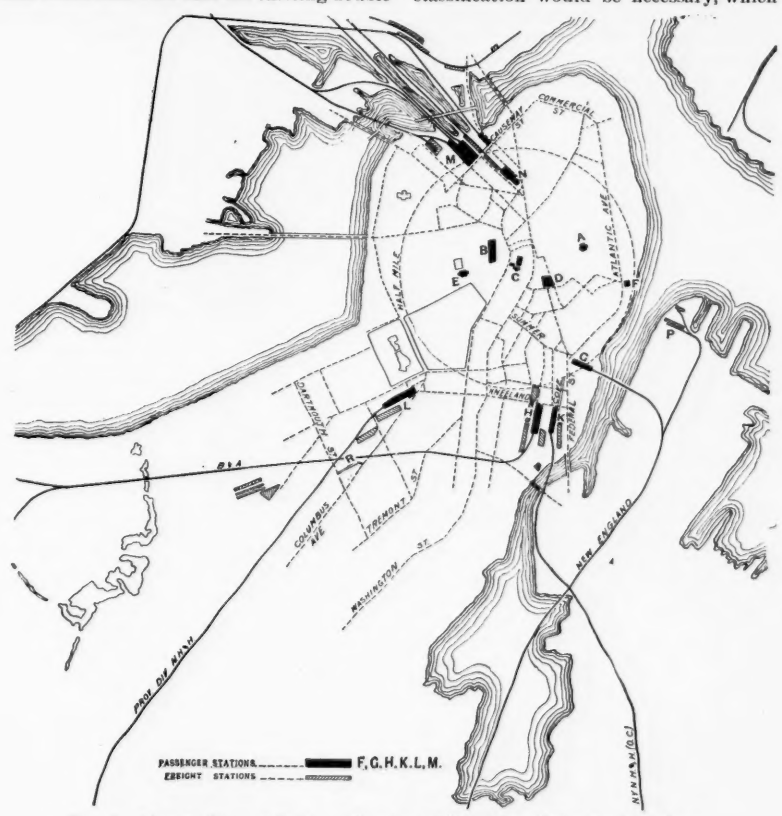


Fig. 3.—Sketch Map of Boston, Showing Railroads and Terminal Stations.

NOTE.—*A*, Custom House; *B*, New Court House; *C*, City Hall; *D*, Post Office; *E*, State House; *F*, Boston, Revere Beach & Lynn Station; *G*, New England Railroad Station; *H*, Boston & Albany Station; *K*, N. Y., N. H. & H. (Old Colony) Station; *L*, N. Y., N. H. & H. (Prov. div.) Station; *M*, Boston & Maine Station; *N*, Old B. & M. Station; *P*, South Boston Freight Station, New England Railroad; *R*, Site of proposed Back Bay Station.

Big Four System, says that his company being a great originator of shipments of bulky, low minimum commodities finds the question of great importance. The only solution is for the roads to agree on maximum limits for all classes. A uniform standard will obviate reckless and expensive competition. It is difficult to decide what the dimensions should be, but he recommends the clear loading space length 36 ft., width 9 ft., height, 8½ ft.; outside dimensions length over sills, 38 ft. 4¾ in., width over sills 9 ft. 8½ in., top of rails to eaves 11 ft. 9½ in. As for the existing smaller and larger cars, an adjustment of the minimums can be made based on the cubic foot capacity of cars for the small equipment, and a penalty per foot above 36 ft. in length would soon drive out the larger cars.

Mr. A. M. WAITT, General Master Car Builder of the Lake Shore, believes that for the ordinary classes of cars a limit should be set to length and capacity, but it will be difficult, if not impracticable, to set a limit in widths and heights that will satisfy all. A 40-ft. car is as long as can be properly built to carry loads of 50,000 lbs. or over. He questions the wisdom of building cars of over 60,000 lbs. capacity for general interchange unless they are built on entirely new plans and of different material from the combinations now used. Eventually, steel will probably take the place of wood in the underframes. Then cars of greater capacity can be built.

Mr. R. QUAYLE, Superintendent Motive Power and Machinery, Chicago & Northwestern: On the lines running west of Chicago the tons per car vary from 9 to 12½. This is the average of the year on important lines. If opinion was based on average tons hauled, 40,000-lb. cars are large enough, but where adequate loads can be got cars of greater capacity are more profitable. In merchandise traffic it is frequently necessary to send out a car with only two or three tons of load, but in the ore business, for instance, the 60,000-lb. cars are very much more profitable than those of 20 tons, and the Northwestern is now having new ore cars built of the large size. It seems to him they ought to be built to carry not less than 70,000 lbs. Were it practicable it would be a good thing to have freight cars built for the different classes of service.

Mr. E. VAN ETTEN, General Superintendent New York Central & Hudson River: Under present conditions we have reached the limit of tonnage with the 60,000 lb. cars. The last freight cars built for his road are 35. ft. long over sills, 8 ft. 10 in. wide, 11 ft. 5¾ in. high at the eaves. These cars with the Fox truck weigh about 26,000 lbs. and carry 60,000 lbs., making in round numbers 85,000 lbs. loaded, or about 22 tons on each truck. Anything heavier than this will, on most of the trunk lines, necessitate new bridges, heavier rails, heavier switching, power, etc., all of which is not warranted from an economical standpoint. As a rule he is opposed to building special large cars for light freight, believing that space should be charged for as well as weight.

Mr. F. D. ADAMS, General Master Car Builder, Boston & Albany, found, some time ago, that the average load on his road from Boston is about 8 tons to a car. There are certain kinds of freight that can be carried cheaper in large cars, but it would be very difficult to get a uniform size without a positive law which would obstruct all improvements.

Mr. R. P. C. SANDERSON, Division Superintendent Motive Power, Norfolk & Western, believes that standard sizes in lengths should be adopted for 50,000 and 60,000-lb. cars only and that larger or smaller capacity cars should not be built for general interchange. These should be 34 ft. and 36 ft. over the bodies. With steel frames cars of 70,000 and 80,000 lbs. can be built for carrying minerals, but considering the small average loads it would not pay to increase the capacity of box and stock cars. The fewer different sizes of cars there are in general interchange the less expense and trouble in the yards.

Mr. A. E. MITCHELL, Superintendent of Motive Power, Erie Railroad. Mr. Mitchell confined himself to an inquiry to show how an increase in the length and capacity of box cars may increase earnings, and reduce working expenses so far as the transportation side only is concerned. His contribution to the discussion we shall print in full in a later issue.

Mr. B. B. MITCHELL, General Freight Agent, Michigan Central: The recent action of Official Classification Committee in readjusting the minimum carload weights will help, but the change is not radical enough. He would favor making a classification providing for rates h undred pounds regardless of the quantity, abolishing the carload rating, except on very heavy freights that can be loaded to 30,000 lbs. in a small car.

Mr. J. T. CHAMBERLAIN, Master Car Builder, Boston & Maine, does not believe it is practicable to build cars to carry over 60,000 lbs. He found from examination of the figures of a road having a heavy western connection out of Boston that the average load taken out was about seven tons.

Mr. HERBERT WALLIS, Mechanical Superintendent, Grand Trunk, thinks the key to the position is the length of the car, and the limit has been reached at 34 ft.

Mr. J. N. BARR, Superintendent of Motive Power, Chicago, Milwaukee & St. Paul, is decidedly of the opinion that the tendency to build large cars is bad from every point of view. The traffic department holds the key to the situation. If their rates did not encourage and almost compel the use of unduly large cars, there would be no difficulty.

W. G. CURTIS, Assistant to General Manager Southern Pacific: I am familiar with a continuous line of railroad 2,500 miles long, transporting regularly miscellaneous freight for the entire distance. This through line is, for the most part, equipped with box cars 34 ft. long, 8 ft. 2 in. wide and 7 ft. high, inside dimensions; weight empty, 27,000 lbs.; load capacity, 60,000 lbs. With the bulk capacity fully utilized, the average lading of these cars with miscellaneous merchandise is a little less than 30,000 lbs.—one-half of the weight-carrying capacity.

There has been used experimentally in this line some large box cars, set low upon the trucks with draft rigging between the center sills, and of the following dimensions: Height from top of rail to top of car floor, 3 ft. 5 in.; length, 40 ft.; width, 8 ft. 8 in., and height, 9 ft., inside dimensions; weight empty, 30,000 lbs.; load capacity, 60,000 lbs. Experience with these cars, which have been run for nearly two years over steep gradients and road having much curvature, a great deal of it to the maximum of 10-deg. curves, indicates that equipment of these dimensions can be run as safely as cars of ordinary dimensions, and by their use the dead weight in each train is considerably reduced, and the live, or paying load correspondingly increased.

Now, while these large cars are undoubtedly economical for the conditions stated, their use would not be advisable under other conditions. For example, take the case of a city (with which I am familiar) of 80,000 people, having a number of short railroad lines ranging in length from 25 to 100 miles, radiating from it. Here competition and other conditions require a prompt freight service, and for the more important of the outlying towns a car must be loaded out from the city every day, and the experience obtained from this situation leaves no doubt of the fact that a car 24 to 28 ft. long, with 10 tons carrying capacity, is the most economical car, inasmuch as the use of such cars tends to show the minimum of dead load and the maximum of paying weight in each train.

Mr. G. W. RHODES, Superintendent of Motive Power, Chicago, Burlington & Quincy: If the railroad makes a minimum load that will not go into ordinary cars it offers a premium to some one to build a car that will carry the minimum load. If the railroads pay the same mileage for hauling a big car that they do for hauling a small one, and if they keep up all the principal repairs, it is obvious that the greatest possible inducement is being offered to build large cars. The present attempt to limit the building of large cars will be of no avail until it is made unprofitable for anyone to build them. He proposes the following rules:

1. The minimum load must never be greater than the carrying capacity of the car.
2. All repairs to cars, except those occurring in wrecks, should be paid for by the car owner. Large cars cost more and are not constructed as strongly as small cars, and they are consequently much more expensive to maintain.
3. The mileage allowances for cars should not be as great for long, heavy cars as it is for light cars. It costs a given figure per ton to haul tonnage, and will cost this figure whether the tonnage is in freight or in dead weight of big cars.

Mr. A. C. BIRD, General Traffic Manager, Chicago, Milwaukee & St. Paul: There is but one solution to the question. That is the classification in rates so that a small car will be as desirable to the shipper as a large car. The practice of applying car load rates based upon minimum rates has made it necessary for the operating department to build cars of extraordinary cubic measurement and haul them long distances for some particular shipment when the side tracks at the shipping point are full of idle cars which are discounted by an unwise classification. This practice has created unjust discrimination between individuals and communities that would not be tolerated if the facts and effects were fully realized. A shipper of bulky freight cannot know what his rate will be until he gets his car. A manufacturer gets a large car to-day and a smaller car to morrow, and he cannot conduct his business with precision. In some instances where bulky freight is involved the actual rate per 100 lbs. charged for a small car is 100 per cent. greater than that charged for a larger one. The only available remedy is a reconstruction of the classification. An article which cannot be loaded in an ordinary car in a reasonable minimum ought not to have a carload rate.

Mr. J. F. GODDARD, Commissioner Trunk Line Association: From a traffic standpoint the question is complicated, largely the result of the lack of an agreed standard between the companies followed by a lack of uniform packages put up by shippers accompanied with the unreasonable demand that cars should be built to fit packages instead of the reverse, which will be the case when the railroads arrange for uniformity. The most equitable way to overcome the difficulty is the adoption in freight classification of a graduated scale of minimum carload weights based on cubic capacity.

Mr. DAVID L. BARNES, Consulting Engineer: In taking up work for several car companies he has concluded that no M. C. B. standard of detail that would be worked will be agreed upon. When steel underframes are introduced manufacturing conditions will compel the use of standard shapes and lengths of rolled sections. The height of cars will not be increased much above the dimensions of the 60,000-lb. car of the Chicago, Burlington & Quincy. (See *Railroad Gazette*, Jan. 27, 1893.) It is not believed that any standard car should be longer than 36 ft. With steel underframes 100,000 lbs. can be carried with a greater margin of safety than is now had with 60,000 lbs. The large makers of rolled sections are getting ready to enter the field of car construction with rolled steel underframes. There will be a saving of weight of about 3,000 lbs. per car, and repairs will be less. There is a decided tendency toward an all-metal truck and larger journals, and toward putting the springs directly over the axle boxes.

Mr. P. F. DAVIS, General Freight Agent, Chicago & West Michigan: The standard box car should be 40 ft. long inside with the same width as the present 34-ft. car, with a capacity of 60,000 lbs. This would come close to filling all requirements of a box car with a dead weight of about 30,000 lbs. Many of these requirements can be filled with a dead weight of about 25,000 lbs., but so many articles cannot be loaded to the required minimum in a 34 ft. car that the business of the country demands a longer car. It is settled that large cars have come to stay. They will be demanded and furnished. Mr. Davis gives a table showing the average weight of various articles that could be loaded into a 34-ft. car and the minimum weight under the official classification. He names 41 articles, and in every case the actual weight is a good deal under the minimum, and in at least one case it is only one-tenth of the minimum.

The Committee of Mechanical Superintendents appointed by the Central Traffic Association and the Western Freight Association: Of this committee Mr. William Buchanan was Chairman, and it was made up of nine other well-known men in the mechanical departments. This committee believed that it would be good economy to recognize 30 ft. long inside of end sheathing as a proper typical length for box, stock and refrigerator cars, also 40 ft. for furniture and buggy cars, and 36 ft. over end sills for flat cars. It would not be economical to build any of these cars for ordinary service with a greater capacity than 60,000 lbs. Considering the average load of a car, which is but a small fraction of its actual capacity, it is a question whether a car of greater capacity than 60,000 lbs. can be economically used for miscellaneous business. If the minimum carload weight under the classification were fixed so that the modern car owned by the railroad companies would have the same chance as the larger and weaker cars which the companies are asked to haul in their trains, the whole difficulty would be met and the building of such larger and weaker cars would cease. The building of such cars cannot be stopped by agreement between the railroad companies; the only way to stop it is to render it unprofitable for any company to own them.

A report of the Western Classification Committee, dated Nov. 15, 1895, is appended. The remedy proposed to stop building large cars would forfeit the economies realized from the use of large equipment, and that would not be radical enough to meet the case. It is proposed that the minimum weight of the classification should apply on shipments loaded to 34 ft., and an addition of 3 per cent. per foot be made the minimum for each foot or fraction in excess of 34 ft. outside measurement. With few exceptions the minimum weights now provided can be loaded on 34-ft. cars. This proposition would realize the same results as building new cars without that expense. Large cars would go where they could be used to their full capacity and thus realize the large economies incident to their use and give shippers a large supply of cars.

Signal Standards on the Pennsylvania Lines West of Pittsburgh.

General Manager Loree of the Pennsylvania Lines West of Pittsburgh, has recently issued a revised manual for the signal department. The opening chapter is a brief statement of the organization of the department, following which is a statement of the general principles of signaling. Mr. Grafton, the Signal Engineer of these lines, is one of our most accomplished signal engineers, and we copy the statement of principles in full.

GENERAL PRINCIPLES OF SIGNALING.

1. The signals used must be of the semaphore pattern, and consist of a post with a movable arm pointing to the right; the arm having either a square or forked end. The shape and position of the arm indicate how trains shall proceed, as follows:

(a) An arm with a square end is a "Home Signal." [A three-position semaphore is used.] In a horizontal position it indicates "danger, stop." Inclined at an angle of 45 deg. to the horizontal, it indicates "caution; proceed carefully." Inclined at an angle of 75 deg. or more to the horizontal, it indicates "safety, proceed." At night these positions may be shown by illuminating the arm, or indicated by colored lights: Red, for horizontal; green for an angle of 45 deg.; white, for an angle of 75 deg. or more.

(b) An arm with a forked end is a "Distant Signal." [The distant is shown in only two positions, but the arm has the same bracket as the home; that is, one with which the arm, when pulled down, hangs exactly parallel to and at one side of the post. The distant has only two spectacles.] It is used in connection with the "Home Signal" for a high speed route, and regulates the approach thereto. In a horizontal position, its indication is to approach its "Home Signal" prepared to stop. Inclined at an angle of 75 deg. or more to the horizontal, its indication is "safety, proceed." At night these positions may be shown by illuminating the arm, or indicated by colored lights—green for horizontal, white for an angle of 75 deg. or more.

2. All Semaphore arms must point to the right.

3. A separate post must be used for each track to be governed.

4. Each signal must be placed, whenever practicable, on the right hand side of the track it governs, except where a bridge is used, when it must be placed over the right hand rail. Where practicable, the tracks should be spread so as to allow each signal to stand directly at the right of the track it governs.

5. High semaphore signals must be used to govern running tracks in their right direction. On single track both directions are right directions.

6. Low semaphore signals may be used to govern running tracks in their right direction at terminal points. They must be used to govern running tracks in their reverse direction and all other tracks in either direction.

7. Excepting for train order and switch signals, two arms must be used on all high home signal posts, the top arm to govern the main or high-speed route, the bottom arm to govern all diverging routes. Where there are no

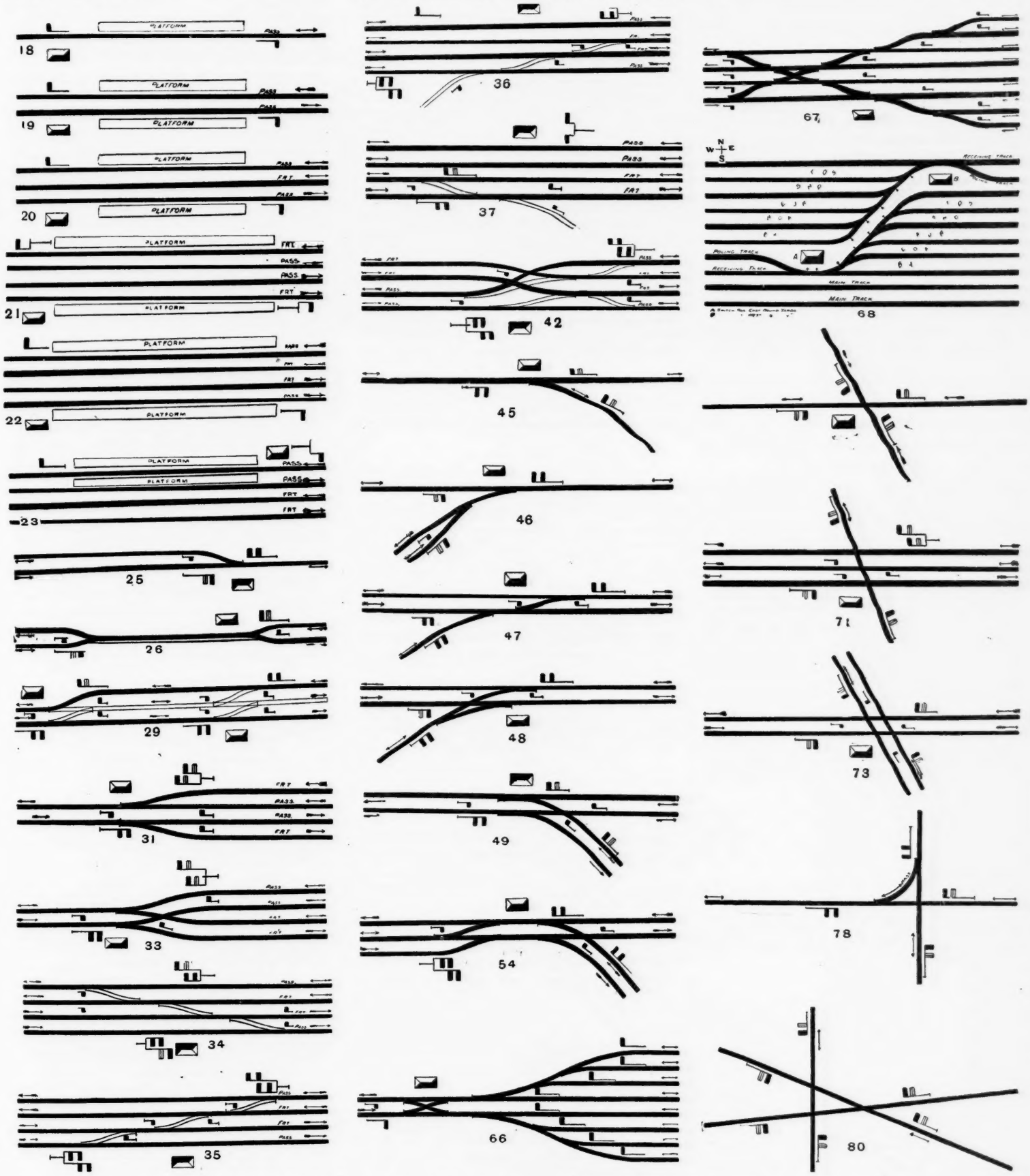
diverging routes the bottom arm must be fixed in the horizontal position and show a red light at night. No more than two arms shall be used on a home signal post, nor more than one arm on a distant signal post.

8. All signals, with the exception of interlocking signals which face the tower, must be provided with back lights.

9. Home signals must be placed at the first fouling point, or point of danger, which they govern.

10. Advance home signals will be used when necessary.

11. Block signals may be made a part of an interlocking system, and when so arranged, a clear distant interlocking signal will also indicate that the block signal is either at clear or caution.



STANDARD ARRANGEMENTS FOR LOCATION OF FIXED SIGNALS—PENNSYLVANIA LINES WEST OF PITTSBURGH.

Mr. W. McC. GRAFTON, *Signal Engineer.*

12. Distant signals must be used only where the speed of trains is not limited by local conditions, and must indicate safety for high speed route only.

13. Distant signals for a tower in advance must never be located at a distance less than 600 ft. in advance of a home signal of the tower in the rear, and in no case shall any interlocking signal be located between a home signal and its distant signal.

14. A high semaphore signal may be used as a distant switch signal at points where the signal at the switch cannot be seen a sufficient distance. This signal in a horizontal position indicates that the switch is open.

Following this, the book contains 67 conventional diagrams of tracks showing the manner of arranging signals for different locations, according to the principles laid down in the book. Thirty of these diagrams are reproduced herewith, each being numbered as in the manual. No. 18 represents a block signal station on single track; No. 19 the same on double track. No. 20 represents block signals on a three-track road, for the passenger tracks only; No. 21 shows the same for a four-track road, and Nos. 22 and 23 show signaling for similar stations where there is a different arrangement of the freight tracks as regards their relations to the passenger tracks. No. 25 shows end of double track; 26 guantlet; 29, middle siding; 31, third and fourth track ending; 33, same with different arrangement of tracks; 34, crossovers, trailing on passenger, facing on freight; 35, facing crossovers; 36, passenger block and crossovers (bracket signals); 37, passenger block and crossover (straight posts); 42, freight tracks changed from one side to center; 45, single track junction; 46, single track junction at end of double track; 47 and 48, single track junction with double track; 49, double track junction; 54, double track junction at end of third track; 66, passenger terminal, high signals; 67, passenger terminal, dwarf signals; 68, distributing freight yard; 69, single track crossing; 71, single track crossing, three tracks; 73, double track crossing; 78, single track crossing and junction; 80, triangular crossing with one set of signals for each pair of crossings.

Following the diagrams the manual contains specifications for the construction of signals, signal apparatus and standard towers. The machine prescribed is the Saxby & Farmer, with Stevens locking, or any other latch-locking machine equally good. Pipe lines must be used for connections to switches, detector bars, locks, selectors and block signals, and *may* be used for all signals. Detector bars are to be not less than 45 ft. long and with square ends. Wire adjusting screws must be capable of giving an adjustment of 12 in. Wire lines to home signals must have an adjusting screw in the tower, and if the home signal is more than 400 ft. away there must be another at the signal. Each derailer must be provided with a wire-bolt lock, placed in the front wires to its home and distant signal. Low signal arms must be made of rubber. Wire connections must be double and the back wire must have 1¼ in. more stroke than the front wire. Compensation must be provided for all wire lines over 600 ft. long (the kind of compensator is not specified). Where a bracket has only one signal post and a track intervenes between the bracket post and the track signaled, a "stub" post 7 ft. long is used to indicate the location of the track not signaled, and at night these stubs have a plain blue light. All foundations, except for carriers, must be set in concrete. Home and distant signal arms must be painted yellow, with a black band. The back side is

painted white with a black band. The top of boxing on ground connections must have a pitch of 30 deg. to the horizontal. Boxing may be omitted where local conditions will permit.

A "general explanation" of signals, for the use of trainmen and signalmen, and conforming to the general principles above mentioned, is shown in the back part of the book. Here it is stated that indicators will be used where it is desired to specify to what track the switches are set.

Witnesses Must Testify Against Themselves.

The Supreme Court of the United States, by a vote of five to four, has sustained Judges Acheson and Buffington in their decision of September last, holding Theodore F. Brown, auditor of the Allegheny Valley, guilty of contempt of court, in refusing to give evidence before the grand jury in May, 1895, when that body was considering an indictment against Bates and Robinson, officers of the road, for discriminating in freight rates. Mr. Brown refused to testify on the ground that his answer would tend to criminate himself. In the Counselman case (142 U. S., 547), a witness thus refusing was excused, under the immunity given by the Constitution of the United States, the Court holding that Section 860 of the Revised Statutes, which aims to secure testimony by promising immunity to the witnesses, did not supply a complete protection. Then, on Feb. 11, 1893, a more definite and comprehensive law was passed by Congress; but Mr. Brown challenged the constitutionality of this also, on the ground that, although he was protected from prosecution he was still subject to the liability of disgracing himself, and on other grounds.

The present decision, written by Mr. Justice Brown, says:

The question before the court was whether or not the law of Feb. 11, 1893, sufficiently satisfied the constitutional guaranty of protection. This law, said Justice Brown, was passed to meet that construction of the constitution; it exempted the witness from any prosecution whatever on account of any transaction as to which he shou'd testify.

"The clause of the constitution in question," continued the Justice, "is obviously susceptible of two interpretations. If it be construed literally, as authorizing the witness to refuse to disclose any fact which might tend to incriminate, disgrace or expose him to unfavorable comments, then, as he must necessarily to a large extent determine upon his own conscience and responsibility whether his answer to the proposed question will have that tendency, the practical result would be that no one could be compelled to testify to a material fact in a criminal case unless he chose to do so, or unless it was entirely clear that the privilege was not set up in good faith. If, upon the other hand, the object of the provision be to secure the witness against a criminal prosecution, which might be aided dir.ctly or indirectly by his disclosure, then, if no such prosecution be possible—in other words, if his testimony operates as a complete pardon for the offense to which it relates—a statute absolutely securing to him such immunity from prosecution would satisfy the demands of the clause in question. It can only be said in general that the clause should be construed, as it was doubtless designed, to effect a practical and beneficent purpose; not necessarily to protect witnesses against every possible detriment which might happen to them from their testimony, nor to unduly impede, hinder or obstruct the administration of criminal justice. That the statute should be upheld, if it can be construed in harmony with the fundamental law, will be admitted. Instead of seeking for excuses for holding acts of the legislative power to be void by reason of their conflict with the constitution, or with certain supposed fundamental principles of civil liberty, the effort should be to reconcile them, if possible, and not to hold the law invalid unless, as was observed by Mr. Chief Justice Marshall, in Fletcher against Peck, the opposition between the constitution and the law be such that the judge feels a clear and strong conviction of their incompatibility with each other."

In concluding the discussion of the case, the opinion referred to the relation of Brown to the transaction under investigation, saying: "It is entirely clear that he was not the chief or even a substantial offender against the law, and that his privilege was claimed for the purpose of shielding the railway or its officers from answering a charge of having violated its provisions. To say that, notwithstanding his immunity from punishment, he would incur personal odium and disgrace from answering these questions, seems too much like an abuse of language to be worthy of serious consideration. But, even if this were true, he would still be compelled to answer, if the facts sought to be elucidated were material to the issue.

"If, as was justly observed in the opinion of the Court below, witnesses standing in Brown's position, were at liberty to set up an immunity from testifying, the enforcement of the Interstate commerce law, or other analogous act wherein it is for the interest of both parties to conceal their misdoings, would become impossible, since it is only from the mouths of those having knowledge of the inhibited contracts that the facts can be ascertained."

From the judgment of the Court, Justices Field, Gray, Shiras and White dissented; Field in a separate opinion, and the others uniting in one prepared by Mr. Justice Shiras.

The Hunt Coupling for Transmission Rope.

The Hunt coupling for rope transmission is designed to do away with the necessity for resplicing, etc., and to keep the rope at the right tension for effective service and long life, and do this with little time or attention. The device is made of aluminum bronze with a tensile strength of 60,000 lbs. to the square inch, and an elongation of 20 per cent. in 8 in. It is simple, the principal parts being a screw and socket. These screw together when the rope is first put on the pulleys and lock securely, so that the coupling can be separated only by a special wrench.

An important feature of the coupling is the internal swivel and ratchet, shown in Fig. 3. The swivel permits the joint to yield to the curvature of the pulleys while the ratchet holds the parts from revolving on each other and untwisting the rope.

The coupling is made smaller in diameter than the rope with which it is to be used, in order that it may

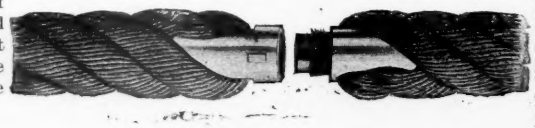


Fig. 1.—Hunt Coupling Before Adjusting on the Pulleys.

not touch the grooves of the pulleys, even when the rope is worn.

The rope of the correct length for the drive when connected up, is spliced into the coupling. As it wears longer, more "turns" are put into it by revolving one part of the coupling, the ratchet automatically holding

Fig. 2.—Hunt Coupling Mounted in the Drive.

all fast when the rope has the proper length and tension.

Where several independent ropes are run side by side on a pulley, all can be kept at the same tension with great exactness by putting a few more turns in the slack one. By using this coupling in a multiple rope drive any single rope can be easily taken off or put on. The cost of a rope drive, with this coupling spliced in and installed in position on the pulleys, is usually less than that of ropes spliced on the spot by the purchaser in the ordinary manner, and it is also less than a rope drive with a tension pulley, which, in addition to its cost, frequently requires space that is useful for other purposes. When we consider that a rope requires to be spliced two or three times during its life, while the couplings, having no wear, are permanent, with no further expense after once put in, this method is probably the cheaper as well as the better one. The advantages, in convenience of installation, facility of adjustment of tension, perfect control of the sag, and increased life of the rope from a more equal tension, seem to be important.

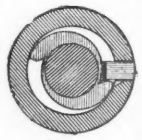


Fig. 3.

The C. W. Hunt Company are the exclusive licensees in the United States for the patent on this coupling, and are prepared to furnish transmission rope of the well-known "stevedore" brand and of the usual sizes with the couplings spliced in position.

The Hauling Capacity of Locomotives.*

[An abstract of the discussion on this paper appeared in our issue of March 20, page 193. Concerning the paper Mr. Vaughan says: "The discussion rather developed the fact that the various mechanical men in this district considered the method I advocated, elementary as it is, rather too theoretical, and preferred to experiment for each and every case that they had to meet. I had rather expected the contrary opinion, that they would consider more accurate tests necessary, as I had been shown a good many complicated calculations based on indicator diagrams, which, it is needless to say, had led their authors into considerable trouble. Of course, by finding your loads by direct experiment you eliminate any theoretical errors, but on a road like ours the labor would be too great. The Great Northern is divided into 136 short divisions for which haulage capacity had to be found, and it is impracticable to try each of the six different classes of engines into which our power is classified, over even a small portion of the road. We made, in all, about 20 to 30 tests; or rather when a master mechanic found a train that he considered well up to the capacity of the engine he found the actual weight of the train and sent it in to this office, together with his remarks as to how the engine handled the train. We were thus soon enabled to fix a percentage of the total tractive force that would be developed on different divisions and on various grades, and could then calculate the larger part of the haulage capacity sheets. We tried provisional ratings on various districts before issuing the completed sheets, and modified our figures in accordance with our experience. You will see, however, that to trust to actual hauls without any theoretical checking to make results uniform is liable to lead to serious errors, as a man will often report an engine loaded to her full capacity, when we find that she should not be, and subsequent trials will generally endorse our figures. This explanation will enable you to understand my position in this matter, that I am simply endeavoring to put the simple text-book formulæ into a form that will enable one to fill in haulage capacity sheets from a series of practical tests."]

In presenting this paper I have no intention of attempting a complete survey of a subject which, in its entirety, includes many complicated problems, but shall simply endeavor to bring to your notice a few points in connection with the calculation of the loads that locomotives can haul on various grades, and under different conditions, that I have found useful in our regular work in that direction.

On the railroad with which I am connected, the system of train rating has recently been changed from one in which the load to be hauled was expressed by the number of cars, to one in which the weight of the train is given in tons. There is no need of my saying anything as to the advantages of the latter method over the former, although it is not a question that affects the traffic department alone, the locomotive department occasionally suffering when one train of 50 cars weighs 50 per cent. more than another, neither do I wish to discuss the limit placed on the load by the length of train that can be safely handled with our present brakes and couplers, or the more debatable question of the most economical weight of trains.

To secure complete accuracy, dynamometric tests should perhaps be carried out, but we have been able to obtain very satisfactory results upon the Great Northern without going into such questions, and while personally I should be very much interested in knowing how closely our results approximated to the truth, as a matter of business I certainly think that they are unnecessary. By obtaining the actual weight of the train in a number of instances in which engines in good condition are known to be worked to their full capacity with fully loaded trains, and from that deducing the percentage of the total tractive force that may be actually developed by the engine, practically the only source of error is that due to the allowance for frictional resistance in the train, and even this is to a certain extent neutralized, when the grades to which such results are applied are not greatly different from the grade taken as a basis of calculation. Supposing 7 lbs. per ton too great an allowance for this resistance, then the actual tractive force calculated from the test would also be too great, and when estimating the load that could be hauled on a different grade, although the proportion of train resistance to grade resistance would not be the same, still for grades of about the same steepness the error would not be serious.

Although, as I have said before, this allowance for frictional resistance may occasionally fall even below 5 lbs per ton, as a general rule it is probably far nearer seven, and that amount has certainly given concordant results in a large number of cases that we have dealt with; even should tests be made with a dynamometer, it would be necessary to take some figure as an average result, to calculate the ratings on the great variety of grades that are encountered on a long road running through diverse country. There are so many factors entering into the resistance of a train, even when the same weight is carried in the same number of cars, that any attempt at extreme accuracy is simply a waste of time, and the most that can be done is to obtain a rating that will accord with average conditions.

The actual tractive force for any engine varies to a certain extent with the length of time it has to be maintained. An engine is usually capable of exerting considerably more power for a short time than could be developed continuously, due to the amount of steam used being above the capacity of the boiler, so that a lower percentage of the total tractive force must be taken for long heavy grades, than for short ones. Poor water and other causes that will suggest themselves to you also make it necessary to decrease the percentage of total tractive force that can be developed as actual where such detrimental factors occur.

The results of tests that have been made on the Great Northern led to the adoption of ratings of 80 per cent., 85 per cent., 90 per cent. and 92 per cent. Eighty per cent. is the rating adopted for long steep grades such as those on the western end of the line, where the engines are worked hard for a considerable time, and the limit is imposed by the rate at which coal can be burnt if the fire is to be kept in proper condition. On grades not exceeding five or six miles in length a rating of 85 per cent. may be adopted, or on long grades when the quality of coal used will admit of more rapid combustion. In some cases we have been able to adopt a rating of 90 per cent for long grades, but this has been where coal and water have both been favorable, and this rating is generally used on undulating track where the maximum power is only required for short distances. A rating of 92 per cent. has been used where the limiting grade on a section of road has been short and the majority of the line easier, and has given reliable results in such cases, even though the train had to be started on grade. This is the maximum percentage that we have used, and engines require skillful handling to develop such power.

No rule can be stated exactly as to which rating should be used, but by making test runs on various parts of the road it is easily ascertained what rating should be used for calculating the complete sheets.

In the preceding remarks it has been mentioned that the weight of train obtained by the formula was that which could be hauled at uniform speed, but in a great many cases in practice grades are so situated that a train can approach them at a fair speed, and it is quite unnecessary for me to tell this audience the aid that is afforded by such speed in getting up a hill.

In the case of a train approaching a grade, it is not, of course, simply allowed to run up hill until it comes to rest, but if the latter part of the hill is passed over at a greatly reduced speed, part of the energy exerted in lifting the train up that grade has been derived from the kinetic energy stored in the train, and the height that the train has been lifted by the engine has been diminished to the same extent. This effect of the velocity of the train as an assistance in surmounting grades which can be approached at speed is important when the grades are short, and if neglected will cause most contradictory results in haulage calculations. A section of road may have a ruling grade of 0.6 per cent., but if such grades only occur in short lengths and are so located that a train can approach them at a fair speed, the assistance derived from the kinetic energy of the train may so reduce the amount of power required from the engine that loads can be hauled far in excess of those given by the formula fo bauch a grade.

In allowing for the effect of the speed of the train, the simplest plan is to determine on a definite speed which can be generally reached in service and at which trains may be supposed to approach all grades where such allowance is to be made. At this speed the kinetic energy of the train is capable of lifting its weight a certain height, and if this is applied to helping a train up a grade, the amount of work exerted by the engine in lifting the weight of the train is diminished by the height to which the train is raised by the transformation of its kinetic energy into potential. If the power exerted by the engine be considered as constant, the grade up which the train is to be raised may be supposed reduced in height by the distance that the train can be raised by its kinetic energy and a grade substituted of which the total rise is lower by that amount. If the loads that could be hauled at a constant speed up the latter grade be calculated, they will evidently be the same as those which could be hauled up the original grade with the assistance of the kinetic energy of the train.

Since the train resistance and curve resistance are overcome by the engine, the height that the weight of

* Extracts from a paper by Mr. H. H. Vaughan, Mechanical Engineer, Great Northern Railway, read at the January meeting of the North West Railway Club.

the train can be raised by its kinetic energy is evidently independent of the grade, and is given directly by the formula $h = \frac{V^2}{64.4}$ all dimensions being in feet and seconds. This height is 20 ft for a speed of 24.5 miles per hour, or 15 ft. at a speed of 21 miles per hour, the latter being quite high enough for regular freight trains, to insure its being attained in service, and in our calculations on the Great Northern 15 ft. has been taken as the height that grades may be reduced by the assistance derived from the speed of the train. Correctly speaking, this represents the height that a train would be raised by the reduction of its velocity from 21 miles per hour to nothing, but as no account is taken of the rotational energy of the wheels, equal to about five per cent. of that of the train, and as the energy at six miles per hour is under 10 per cent. of that at 21, 15 ft. may be taken as a height to which the train can be lifted by speeds easily obtained in service. Suppose, for example, that 5,000 ft. of one per cent. grade were so situated that trains could approach it at speed. The total rise of the grade would be 50 ft., but of that 15 ft. could be overcome by the energy of the train, leaving 35 ft. that the train must be raised by the engine. . . .

Since the height to which the kinetic energy raises the train is independent of the length of the grade its effect becomes far less when the grades are long than when short. Thus, for a one per cent. grade 1,000 feet long, since the total rise is only 10 ft., the kinetic energy would be more than sufficient to raise the weight of the train up the entire grade, leaving only the frictional resistances to be overcome by the engine; whereas, if the grade where 50,000 ft in length, or a total rise of 500 ft., the energy of the train would only reduce this by 15 ft., leaving 485 ft., or the equivalent of a 0.99 per cent. grade, to be overcome by the engine, a reduction not worth considering.

In making this allowance for speed in practice the total rise of the grade can be obtained from the profiles: 15 ft., or whatever figure is agreed upon, is taken from the rise and the remainder divided by the length of the grade, giving a reduced grade upon which loads can be calculated on the assumption of constant speed, which loads can be hauled on the actual grades when the engine is assisted by the kinetic energy of the train. An equivalent profile is thus obtained for any section of road which will often be very different from the actual one, and will illustrate the magnitude of the errors introduced by neglecting the effect of speed. I should not advise, however, that any reduction should be made when the total rise of the grade exceeds 100 to 120 ft., and when the total rise of any grade exceeds that amount would recommend that the effect of speed be neglected in making the calculations, for the length of grade at which the compensation ceases to hold is measured by the time occupied in climbing the grade.

It will be found most important to make the allowance for speed when deducting the tractive force from test trains, and the speed should be noted accurately both at the foot and summit of the grade.

When estimating haulage capacities at such percentages as I have mentioned above, running up to 90 per cent. and 92 per cent. for short grades, it must be borne in mind that all conditions are supposed to be favorable, and that the engines are loaded heavily. If a high average speed is required these loads must be decreased, and trains must be reduced in cold or stormy weather or where strong winds are encountered. This is most easily effected by a reduction of the rating by percentage, and the following table is presented as one that has been found to meet such conditions fairly well:

Fast trains, scheduled at 18 to 20 miles per hour...	10 per cent.
Frosty or bad wet rail.....	7 "
Freezing to zero.....	15 "
Zero to 20 deg. below.....	20 "

For severe storms or blizzards no definite rating can be made, and the weight of train must be left to the judgment of those in charge who are acquainted with the actual conditions.

I have referred before to the influence of the length of train on the load that can be hauled, although I believe that is a point very generally neglected in haulage sheets. It is a matter of common knowledge that an engine which will haul a loaded train of 1,500 tons would be quite unable to pull that weight of empties, and in fact would not be expected to. So far as I am aware no simple rule has been evolved that will meet such cases, especially when the trains are partially loaded, but Mr. Pattee of the Great Northern has proposed a plan which I think covers the point accurately and has the indispensable advantage of simplicity. To the calculated rating an amount is added equal to the number of loaded cars in that rating multiplied by six, or by eight for divisions where severe curves are met with, and when making up the train six or eight tons, as the case may be, is added to the weight of each car. Taking six tons as an example, and the weight of a loaded car at 36 tons and of a light car at 12, then instead of the number of cars in a fully loaded train being to the number of cars in a train of empties as 12 to 36 or as 1 to 3, it becomes as 18 to 42 or 1 to 2⅓—about the proper proportion. In the case of a rating of 1,500 tons, which would equal 41⅔ cars, 6×41⅔ or 250 tons would be added to the rating, which would stand at 1,750 tons on the haulage sheet; the loaded cars would now be taken as weighing 42 tons, which would make the number of loads 41 as before; but an empty car would be taken as weighing 18 tons instead of 12, and the number of empties in a train would become 97 instead of 125 when no correction was made. It is evident that not only will this rule give results that proportion the weight of train correctly when it consists of either fully loaded or empty cars, but when cars are partially loaded it will give results intermediate between them and strictly in accordance with the proportion of the load carried to the number of cars. There is no complexity in the work required of the yard force or conductors, the only alteration from the present system being the addition of six or eight tons to the weight of each car. Six tons is a figure that will give good results in districts where the curves are not sharper than six degrees; where sharp and successive curves are met with eight tons or even ten tons may be used, and will give results in accordance with our experience.

Some rule of this kind is badly needed in all haulage sheets, not only when trains of empties are handled, but when partially loaded trains are hauled, especially when severe curves are met with or heavy winds are frequent, and I take great pleasure in presenting this rule to you as one that I think will give satisfaction without any complication.

Train Accidents in the United States in February.

COLLISIONS.

REAR.

5th, on Baltimore & Ohio, near Barnesville, O., a freight train ran into the rear of a preceding freight, wrecking 6 cars. A brakeman was killed and another man injured.

16th, 11 p. m., on New York, New Haven & Hartford, at Parkville, Conn., a freight train which had stopped to leave a car was run into at the rear by a following freight, doing considerable damage. A fire started in the caboose and one car was burned up. One brakeman was injured.

19th, on Duluth, South Shore & Atlantic, near Houghton, Mich., a passenger train ran into the rear of a preceding freight, wrecking the cabcose, which took fire and was burned up. A brakeman was fatally burned and a freight conductor injured. It is said that a flagman went back from the freight train, but that his signal was not seen on account of a snowstorm.

29th, on Chicago, Rock Island & Pacific, near Troy, Kan., a passenger train ran into the rear of a preceding freight which had stopped for water, and, according to the reports, had not sent out a flag, as should have been done. Six freight cars were wrecked. Three passengers and a fireman were injured, the latter fatally.

And 8 others on 8 roads, involving 3 passenger and 9 freight and other trains.

BUTTING.

4th, on Wabash road, at Carpenter, Ill., butting collision of freight trains, making a bad wreck. One fireman was killed and 2 other trainmen injured. It is said that one of the trains passed a meeting point ahead of time.

11th, 7 a. m., on Illinois Central, near Dongola, Ill., butting collision between a passenger train and a mixed train, making a bad wreck. Both firemen, one engineman, a baggageman and a brakeman were killed and 4 other trainmen were injured. It is said that the passenger train disregarded an order to wait at Wetaug.

12th, at 1 a. m., on New York Central & Hudson River, near Macedon, N. Y., butting collision of freight trains both running at high speed, making a very bad wreck. Both firemen and one engineman were killed and 3 other trainmen were injured. The eastbound train ran past a distant and a home signal at Fairport, through two crossover tracks and about five miles on the westbound track to the point of collision. The engineman and fireman of this train were both killed, and the conductor, who was in the caboose, says that he did not notice that he passed through the crossovers. Two trailing point switches were opened by the engine.

15th, on Union Pacific, at Grand Island, Neb., butting collision between a regular westbound and an extra eastbound passenger train, damaging both engines; 2 employees injured.

17th, on Southern Pacific, at Shorb's, Cal., butting collision of passenger trains, due to a misplaced switch, badly damaging both engines. A brakeman was injured.

20th, on Lehigh Valley, near Stafford, N. Y., butting collision between a freight train and a snow plow. One engineman injured.

22d, on Baltimore & Ohio, near Wadesville, Va., butting collision between a passenger train and a freight, one engine and three cars falling down a bank. One engineman injured.

29th, 9 a. m., on New York Central & Hudson River, at the Grand Central Station, New York City, butting collision between an inward passenger train, from which the engine had been detached (a running switch), and a switching train just starting out of the station. The engine and one passenger car were damaged and five passengers were injured. The signalman, neglecting to look out before he cleared the signal, mistakenly assumed that the track occupied by the switching train was clear.

29th, on Philadelphia, Wilmington & Baltimore, near Blackbird, Del., butting collision between a freight and a work train, wrecking both engines and 10 cars. Two trainmen were killed and 3 injured. It is said that the dispatcher had given conflicting orders. There was a dense fog at the time of the collision.

CROSSING AND MISCELLANEOUS.

9th, 1 p. m., near Hannibal, Mo., a passenger train of the St. Louis, Keokuk & Northwestern was run into by a stock train of the Wabash at the junction of the two roads and one passenger car fell down a bank. The 15 passengers in it were all injured.

13th, on New York, New Haven & Hartford, at Pittsfield, Mass., a passenger train ran over a misplaced switch and on to a track leading to the engine house, where it collided with three locomotives, making a bad wreck. Two firemen and one engineman were injured.

14th, on Portland & Rumford Falls, near Byron, Me., collision between an empty engine and a runaway car loaded with logs, making a bad wreck. The engineman and a brakeman were injured, the former fatally.

14th, on Ohio River road, near Parkersburgh, W. Va., collision between a freight train and a switching engine; the caboose and one freight car fell off a high trestle; conductor and brakeman injured.

17th, on Pennsylvania road, at Jersey City, N. J., collision of switching freight trains in the yard, doing slight damage; 2 trainmen badly injured.

18th, on Baltimore & Ohio, at Demmler, Pa., collision between a work train and a switching engine, wrecking one engine and 2 cars; 2 employees injured, one fatally.

26th, on New York Central & Hudson River, at Amsterdam, N. Y., a freight train moving from a siding to the main track was run into by another freight running in the same direction, derailing 20 cars. A fireman was injured.

And 6 others on 6 roads, involving 3 passenger and 9 freight and other trains.

DERAILMENTS.

DEFECTS OF ROAD.

4th, on Canadian Pacific, near Greenville, Me., a passenger train was derailed by a broken rail and all of the cars were ditched; but it is said that only one person was injured out of the 71 on the train.

10th, on Boston & Maine, at East Boston, Mass., a passenger train was derailed at a switch which is said to have been broken as the engine passed over it; one passenger car struck a freight car on a side track, and 4 passengers were injured.

18th, 7 a. m., on Central Vermont, near Ludlow, Vt., a passenger train was derailed by a broken rail and 3 cars fell down a high bank. There were only 3 passengers on the train; these and 3 trainmen were injured.

And 3 others on 3 roads, involving 3 freight trains.

DEFECTS OF EQUIPMENT.

8th, on Cleveland, Canton & Southern, near Dell Roy, O., the passenger car of a mixed train was derailed by the breaking of a truck, and fell down a bank. Eight passengers were injured, one of them being somewhat burned by a fire which started in the car as soon as it fell.

11th, on Vicksburg, Shreveport & Pacific, near Gibbsrand, La., a freight train was derailed by a broken wheel and 12 cars were ditched. A passenger in the caboose was injured.

12th, 3 a. m., on Southern Pacific, near Borden, Tex., a freight train was derailed by a broken wheel on a bridge and several cars were ditched. A tramp was killed.

19th, 11 a. m., on Delaware, Lackawanna & Western, near Cassville, N. Y., the locomotive of a passenger train was wrecked by the explosion of its boiler. The engine was derailed and fell into the ditch and one truck of the first car ran off the track. The engine and fireman were killed.

21st, 4 a. m., on Chicago & North Western, near Moingona, Ia., a car in a freight train descending a grade was derailed by the falling of a brakebeam, wrecking several cars in the rear part of the train. At the same time the train parted near the front end and the second portion afterward ran into the first one, wrecking 7 cars. A brakeman was fatally injured.

And 16 others on 14 roads, involving 5 passenger and 11 freight and other trains.

NEGLIGENCE IN OPERATING.

10th, 11 a. m., on Cincinnati & Muskingum Valley, near Crooksville, O., a passenger train was derailed at an unfastened switch and the engine and first car fell down a bank. The baggage master was killed and 5 other employees and 3 passengers were injured. The misplacement of the switch is charged upon a section man who had been cleaning snow from the track.

12th, 5 a. m., on Louisville & Nashville, at Clarksville, Tenn., a freight train was derailed by a misplaced switch; one brakeman killed and 2 other trainmen injured.

26th, on Long Island road, at Long Island City, N. Y., a switching train backing freight cars upon a barge was not properly controlled and one car fell into the river. A brakeman was injured.

And 2 others involving 2 passenger trains.

UNFORESEEN OBSTRUCTIONS.

3d on Norfolk & Western, near Dunlow, W. Va., a freight train was derailed by a landslide and 12 cars were ditched. The engineer and fireman were injured, the former fatally.

7th, on Pennsylvania road, near Retreat, Pa., a passenger train was derailed by a landslide, and the engine fell down a bank. The engineer and fireman were injured.

9th, on Union Pacific, Denver & Gulf, near Georgetown, Col., a passenger train (narrow gage) was blown off the track by a high wind and 6 passengers were injured. The accident occurred near the Loop, where similar accidents have occurred several times before.

11th, on Erie Railroad, at Cleveland, O., several cars in a freight train were derailed by a flood of water which came from a ruptured pipe on a hill at one side of the track; some of the cars were swept into the Cuyahoga River, with 3 trainmen who were on them. One of the men was badly injured and nearly drowned.

11th, on Colorado Midland, at Ivanhoe, Col., the foremost of two engines drawing a passenger train was derailed by a rock which had fallen upon the track, and fell into the ditch. The engineman was killed.

16th, 8 p. m., on Louisville & Nashville, at Jackson's Lake, Ala., a passenger train was derailed by running over a cow, and the engine fell down a bank. The fireman was killed and the engineman injured.

22d, 5 p. m., on New York Central & Hudson River, at Brockport, N. Y., a snow plow was derailed by striking some obstruction as it passed a switch, and the plow and one of the engines pushing it fell down a bank. One engineman was killed and a fireman injured.

25th, on Delaware River Railroad, at Paulsboro, N. J., a passenger train struck a wagon on a street crossing, injuring the driver and derailing the locomotive.

29th, 7 p. m., on Southern Railway, near Macon, Ga., a passenger train was derailed on a trestle, and after running some distance on the sleepers fell into the stream below, making a bad wreck. The fireman was fatally scalded, the baggageman was killed, and 3 passengers and 3 trainmen were injured. It is said that a rail had been maliciously loosened.

A few minutes afterward a freight train, which had left Macon 10 minutes behind the passenger train, came on and was derailed at the same point, the engine landing about 50 ft. from the rear car of the passenger train. The fireman of the freight train was killed. It is said that a signal was sent back from the passenger train, but not quite in time.

And 7 others on 7 roads, involving 5 passenger and 2 freight trains.

UNEXPLAINED.

7th, on Missouri, Kansas & Texas, near Aubrey, Tex., a freight train was derailed and 10 cars were ditched. A tramp was killed and another injured.

8th, on Buffalo & Susquehanna, near Cutlers, Pa., a snow plow was derailed and fell down a bank. One employee was injured.

12th, on Kanawha & Michigan, near Dexter, O., a freight train was derailed and 3 tramps were injured.

12th, on Norfolk & Western, near Ceredo, W. Va., a freight train was derailed and several cars wrecked; conductor and one brakeman injured.

12th, on Buffalo & Susquehanna, at Cross Fork Junction, Pa., a freight train was derailed and a brakeman was killed.

14th, 9 p. m., on Chesapeake, Ohio & Southwestern, at Moffat, Tenn., passenger train No. 10 was derailed, and the engine and baggage car were overturned. The engineman was injured.

15th, on Kansas City, Memphis & Birmingham, near Palos, Ala., a freight train was derailed and the engine was overturned. The fireman was killed.

18th, on Norfolk & Western, near Ceredo, W. Va., a freight train was derailed, and several cars were wrecked. The conductor and one brakeman were injured, the former fatally.

19th, 7 p. m., on Lehigh Valley, near Cheektowaga, N. Y., a snow plow was derailed, and one brakeman was killed and another fatally injured.

And 33 others on 23 roads, involving 6 passenger and 27 freight and other trains.

OTHER ACCIDENTS.

20th, on Nashville, Chattanooga & St. Louis, at Bridgeport, Ala., the locomotive of a freight train was wrecked by the explosion of its boiler; engineer and fireman killed; brakeman fatally injured.

And 3 others on 3 roads, involving 3 passenger trains.

A summary will be found on another page.

Pintsch Gas on Mail Cars.

The Safety Car Heating & Lighting Co. has sent to us a list showing the mail cars now running in the United States equipped with Pintsch light. The total number is 354. The New York Central leads with 40 cars so equipped; next is the Union Pacific with 30; then follow the Lake Shore with 27; the "Big Four," 22; the Southern Pacific (Pacific division), 20; the Erie, 19; the Missouri Pacific, 18; the Texas & Pacific, 14; the Boston & Albany, 13; the Michigan Central, 10; and the Delaware, Lackawanna & Western, 10. There are no other lines reported that are running as many as 10.

RAILROAD GAZETTE

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EDITORIAL ANNOUNCEMENTS.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting, and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

The Supreme Court of the United States has decided that, in spite of the Constitutional exemption, witnesses must give testimony that shows themselves to be guilty of lawbreaking, in cases where Congress has promised not to punish them. A report of the decision appears on another page. We shall be glad to see violators of the Interstate law more promptly and adequately punished and we hope that the Interstate Commerce Commission will catch every one of them; most of the men accused by the Commissioners who have got off have done so by technicalities and subterfuges which were outrages on justice. But we still believe, as we said on Oct. 11 last, that to compel a witness to appear in court, and own up to illegal acts which he knew of and voluntarily concealed, is contrary to the Constitution of the United States. Judge Grosscup so decided. It appears that four Supreme Court justices agree with him, and the dissenting opinion which they have prepared will doubtless be an interesting paper.

We return to the report on the Nicaragua Canal to call attention to two facts. First, the edition printed was very small; merely enough copies were printed to supply one to each member of Congress. Second, the Board submitted with the report 12 appendixes and 34 plates which are listed in the table of contents of the report, but none of which were printed. A bill was introduced by Senator Cockerill to have 12,000 copies of the report printed, and we hear that an effort will be made to have the appendixes printed also. We do not know the progress or the fate of Mr. Cockerill's bill, but it is quite certain that the report ought to have the widest publicity. It contains matter which every voter ought to know about and it should go to the office of every important newspaper in the land. It is by all odds the most valuable document ever written on this project, which is one of the most important that the nation has ever been asked to engage in. The people have paid for the information gathered by the Board, and yet there seems to be almost a conspiracy against letting the people get hold of this information. This holds true also of the appendixes and plates. Among the appendixes we find one giving the correspondence with the canal company, others giving the records of river gagings and of rainfall observations; another on volcanoes and earthquakes. The list of maps and profiles covers pretty nearly everything that has ever been done in the way of collecting information that can be plotted, including surveys, going back as far as 1832. It covers also the company's sections of canal, embankments and sluices, and includes profiles of the railroad, of gage readings of the San Juan River and of various streams and of meteorological observations. With these documents before him the reader could judge of much that the Board says in its report. He need not take the Board's word or our word; he could judge from the original documents whether or not the canal company has collected a reasonable mass of information. From the appendixes giving the correspondence he could judge whether or not the Board made due effort to draw out this information from the archives of the canal company and could judge of the spirit in which the company met this effort. As matters stand now the public will think, and has a right to think, that someone is trying to suppress information; but who has any interest in suppressing information? Surely no one has who wants the right thing done. If information is suppressed obviously that is not done in the interest of the public; it must be done in the interest of someone whom the information would injure. We ask the attention of the great daily newspapers, the "guardians of our liberties," to this opportunity to do a really valuable public service. If they want the truth about the Nicaragua Canal the most obvious step to take is to urge the publication of these suppressed documents.

We ask special attention to a letter from Mr. Fernow printed in another column. It appears quite improbable that Congress will supply the very small sum necessary to carry on the extremely valuable timber tests that have been conducted under the Division of Forestry of the Department of Agriculture. The chief use that Congressmen have for that department seems to be in the distribution of seeds (at the public expense) from which fine flowers of office may be grown for their private good. We are not prepared to debate the question whether the Department of Agriculture is or is not worth to the country what it costs. In general we should be inclined to take the negative; but the Division of Forestry has done work of immense value. In the studies of properties of timber which now seem likely to cease for want of money and interest in the matter (so far they have cost about $40,000) accurate information has been collected and disseminated, which is worth many times—no one can estimate how many times—what it has cost. For example, it has been proved and made known that pine tapped for turpentine "is in no respect inferior to unbled timber." A result of this one determination will be a great addition to the wealth of owners of pine timber in the South. It is unnecessary to point out to engineers the value in the arts of peace of the comprehensive tests that have been carried on for the Department in the laboratory of Washington University. We merely suggest to them that they proceed to enlighten their members of Congress and turn the interests of those members for an hour or two in a useful direction.

The Panama Canal and the Nicaragua Canal.

We have from reliable sources some information about the Panama Canal which is not only important in itself, but has an important bearing on another great enterprise.

The affairs of the new Panama Canal Company are directed by a board in which sit representatives of fifteen (we believe that is the number) of the most important financial houses in Paris. This board is trying to put the undertaking on a sound basis—not what a promoter thinks a sound basis, but what the engineer and the financier will recognize as such. Certain construction work is going on at the Isthmus, but we understand that it is only such as is necessary to preserve the work already done and to improve the entrance, which will be a work of some use if the canal is never built. The most important work now is collecting information. For that purpose the new company will soon have spent $1,000,000—not $350,000, as is advised for the Nicaragua Canal, but $1,000,000. Elaborate hydrographic surveys, river gagings, rainfall measurements and land borings have been made. The precise facts will be made known.

One might suppose that the facts would have been gathered before $300,000,000 had been spent. (Two hundred and sixty million dollars was the official figure of the liquidator, as "amount spent," not face value of securities.) But the old company had the same large faith in its enterprise, and the same disregard for the remorseless laws of nature that the Nicaragua Canal Company has shown, and the old company was wrecked not by fraud alone, but by fraud and ignorance. An engineer and a careful student, in writing to us about this canal in 1892, said "it has never been approached from the engineer's standpoint, whose aim is to remove or overcome obstacles, but not to proceed in reckless defiance of them." Now the undertaking is being approached from the engineer's standpoint.

When the new company gets together the information necessary to a judgment it will submit that information to an international commission of engineers. It is expected that some of the most responsible American and English engineers, as well as French engineers, will be induced to serve on this commission. The judgment of that commission will determine the further action of the company.

Another piece of information comes to our knowledge from the same reliable source. We are told that it is a fact that the foreign agent of the Nicaragua Canal Company has, within a short time, offered the concession and other assets of that company to the Panama Canal Company. The offer was made through an intermediary, a Spaniard, but was not even entertained by the Panama Company. Very likely this is the origin of the story that has been flying around, that a combination of the two interests was to be made. Possibly the offer was not made in good faith; possibly it was only made for its effect on public opinion in the United States, and made in such an irregular way that it could be repudiated or denied. But that it was made we have no doubt.

Men who have soberly and carefully studied the situation, and who have the interests of our country very much at heart, have time and again asked that the nation be not made responsible for the Nicaragua Canal until the physical facts about the project were known and have repeatedly urged delay on that one ground. They were always met by two answers. First, we already know all about the ground. Second, we must hurry or some foreign power or interest will buy the financial control. The absolute worthlessness of the first answer is now made known by the conscientious work of the Engineer Board whose report we have recently examined. The second answer is just as worthless. It has long been apparent that foreigners could buy the concession whenever they wanted it. There has been no lofty and self-sacrificing patriotism on the part of the company. With them it is cold business. The offer to sell to the Panama company and its fate is simply more evidence of what we have been saying. Foreigners can buy the concession if they want it, but they don't want it. Or, if the offer was not made in good faith, it was made to force Congress to buy; for that is what a guarantee of the bonds amounts to.

History Repeating Itself.

Four persons killed, a dozen seriously injured and 50 others hurt more or less severely is the result of a butting collision of electric cars at St. Louis, on Sunday evening March 8. Recklessness, either of officers in failing to prescribe rules, or of motormen, generally ignorant, in carrying them out, is apparent on electric railroads all over the country, and collisions or runaways illustrating it occur every few days; but fortune favors the fatuous, fatalities are few, and the lessons bearing on future practice seem not to be heeded.

Here, however, is a flagrant case, in many respects typical. The road (the St. Louis & Kirkwood), runs, a part of the way at least, on its own right of way, separate from the street, so that cars can be run as fast as may be desired. Grades are steep and cars pretty heavy so that high speed down grade is easily made. The *Republic* reporter timed several cars and found them making 40 miles an hour. The manager has had no experience on standard railroads, entrusts cars to men hired without adequate inquiry, and has no printed regulations. A written memorandum of some kind is given to motormen. Ruling trains are required to wait three minutes at meeting points, and those going in the opposite direction indefinitely; but it appears that this last provision is modified most of the time so as to permit an inferior train to proceed cautiously after 10 minutes. Trains appear to be run in this way without any supervision, and inferior trains are in the habit of "stealing switches" whenever it seems desirable. An attempt to do this—to reach the next meeting point before the ruling train gets there, while the whereabouts of the latter is wholly unknown—was what caused this collision. To cap the climax, the passengers on these 40-miles-an-hour trains are allowed to crowd the front platforms of the cars.

The lessons of such a collision are so plain that we hesitate to restate them, but possibly their very simplicity has led street railroad directors to overlook them. The first and main lesson is that not one man in 50, of the class from whom motormen are chosen, realizes the relation of grades, momentum, speed and brake power, until he has learned the lesson by slow experience. Ordinary common sense, to say nothing of technical skill, should make this plain to any manager, and lead to the thorough examination and training of all candidates for places on cars. The safety of steam railroad passenger trains to-day is the result of the lessons of forty years' experience, say from 1830 to 1870, and most railroads, fortunately, have had freight trains with which all necessary blunders could be made. It was not necessary to kill or injure scores of people in every experimental test of the question whether trains could meet and pass on single track. Now, after vehicles have been moved at high speed for

more than 60 years, we have the spectacle of these simple lessons being learned over again, with the difference that the experiments are now conducted with cars loaded with passengers.

In "stealing switches" the street railroad men seem to think that they have a trick that, for 'cuteness, beats the steam railroad men all out of sight. The correction of this, as of other details of practice, is to be included in the general reform suggested in the preceding paragraph, but we may note in passing that this very scheme used to be tried on Western railroads, and as in St. Louis to-day, was winked at, or, rather, openly approved by the superintendents. In the West they had the unlimited view of the unbroken prairies, and felt sure that they had made a time-saving invention; but familiarity bred contempt, each engineman always tried to get more than half way to the next sidetrack, even after he saw the other train (so as to make the later back up, instead of backing his own train), and various new risks were added to the original one. One evening on the Burlington road, some 30 years ago, an engineman, westbound, got so anxious to get one station farther, that he could not take time to light his headlight. The line was perfectly straight, daylight had not entirely faded away, and he thought he would run the risk. But it happened that another engineer, behind this one, also wanted to get along as well as possible that night, and followed close behind No. 1. Then when the eastbound train came on, the foremost westbound engine was descending a grade into a little hollow, the second one, drawing a train of emigrants, was close behind, and the eastbound engineman, desending into the hollow from the other way, looked directly over the first westbound engine, and saw the second one by the light of the fire in its ashpan. He estimated the distance to the light more or less correctly; but he collided with the dark engine, the emigrant train crashed into the wreck of both, and many poor emigrants were killed. Then the rules were changed and the movement of ponderous vehicles at high speed was no longer left subject to the untrained discretion of men whose uppermost thought was to get home on time.

The St. Louis & Kirkwood Line provides telephones on every car and there are places every 2,000 ft. along the line where they can be attached to a line wire making connection with the superintendent's office; and this was mentioned after the collision as one of the precautions taken by the company to prevent accidents. The most obvious comment upon this arrangement is that men will not communicate with the superintendent except when they think they can save time by so doing; and it does not appear that the motormen were instructed as to the uses to be made of the telephones. If a car were smashed to pieces close to a pole where connection could be made, and there were no other way to send word to headquarters, the dullest conductor would use the wire; but in less pressing emergencies, when, by taking a little risk, the bother of asking for orders can be avoided, the risk is pretty sure to be taken. The questionable wisdom of the precautions taken by the company to insure the safety of its cars and passengers is evidenced by another incident mentioned in the reports. A reporter riding on one of the cars, which was run at high speed, noticed that there was difficulty in making the trolley maintain contact with the feed wire. At one place it slipped off and the car ran an eighth of a mile before the attendant succeeded in replacing it. During this time the availability of the electric power as an auxiliary or emergency brake power was, of course, *nil*. And it appears that this difficulty with the trolley has been so troublesome that an extra man was put upon some or all of the cars to attend exclusively to the trolley.

The Northern Pacific Reorganization.

In view of the great importance of the project, we give a more detailed discussion of the proposed Northern Pacific plan of reorganization than we were able to prepare last week. The plan is perhaps the most interesting of all the recent schemes for reconstructing insolvent railroads, not only as a remarkable compromise between the opposing interests, but for the beneficial effect which its success will have on the business situation in the Northwest.

The publication of the plan has been assumed to put an end to the talk about an arrangement with the Great Northern Company, by which the latter was to annex the Northern Pacific and operate the whole as a single colossal system. The present plan has obviously one definite purpose, namely, to put the Northern Pacific Railroad on its own feet again as an independent property and give it a chance for the future. The Chicago & Northern Pacific and the Wisconsin Central are really separate companies and are thus not included in the reorganization, which deals only with the Northern Pacific system, properly so called. But we must remember that Mr. Hill has laid down the condition that the reorganization of the Northern Pacific should be completed before he would undertake to bring about the combination. So we may yet hear more of this plan; although it seems unlikely.

The two most striking features of the plan are its frankness in dealing with the finances of the system and its severity in cutting everything down to rock bottom. In these respects it is like all the recent reorganizations conducted by J. P. Morgan & Co. and perhaps is the leading example of them all. In years past a great deal of railroad reorganizing was done in this country which was only specious and not thorough, which tried to varnish over rotten places and give a false appearance of soundness without cutting to the root of the difficulty: which treated all interests as tenderly as possible, to their great momentary satisfaction, but to their permanent destruction, as always appeared sooner or later. We need go no further back than the second so-called reorganization of the Atchison system in 1889 for a beautiful specimen of this sort of work and the cumulative results of disaster which are bound to follow it. No terms are too strong in which to condemn this kind of reconstruction of insolvent railroad properties, and it is the great merit of the work which has been done in this field in the last three years that a totally different spirit has prevailed, a spirit of severity and thoroughness in reorganization, which attempts no concealment, looks the financial facts squarely in the face, and mercilessly reduces a mass of paper securities to their actual value. As an example of this latter working theory the present Northern Pacific plan is unrivaled by any of its predecessors.

The greatest difficulties connected with this property are the complicated arrangement of its securities and the unusually large amount of actual cash required in very short order. The first of these difficulties is strikingly put in the opening words of the committee: "The property comprises, in various forms of ownership and control, a railroad system of 4,706 miles; a land grant of 43,000,000 acres; sundry bonds, stocks and accounts, representing interests in terminal, coal and navigation companies. This property is represented by fifty-four corporations which have issued $380,000,000 of bonds and stocks, of which all are now outstanding." On this mass of securities the fixed charges alone amount to $10,509,690, and the net income for the year ending June 1895 was only $6,015,846. Such figures need no comment. More than this, the physical condition of the property has necessarily run down during recent years, while there has been no money to cure this difficulty.

The main objects of the plan of reorganization which give, better than the detailed financial figures, the real nature of the treatment proposed for the property, may be laid down as follows: 1. The abandonment of Chicago as the Eastern terminus and the limitation of the system by the Mississippi and the Great Lakes. 2. The ultimate union of main line, branches and terminals under direct ownership of a single company. 3. The reduction of fixed charges to a figure below reasonable minimum of earnings. 4. Ample provisions for additional capital for future development of the property.

As to the first of these objects it may seem extremely doubtful whether it can ever be accomplished or, if achieved for a time, whether it can be made permanent. A railroad system of such magnitude would almost of necessity gravitate to Chicago, and would not content itself with reaching that center by traffic arrangement with other roads.

The first steps toward attaining the second object above stated is the proposed simplification of the complicated finances of the system. The statistics as to the new securities and the ratios of their exchange with the existing securities were given in the news columns of the *Railroad Gazette* of last week, and need not be here repeated, except so far as may be necessary for a brief discussion of the financial reconstruction of the property. The new securities are simply of four classes graded so as to represent the actual and speculative values of the property as follows: A prior lien mortgage of $130,000,000; a general mortgage of $60,000,000; preferred stock to the amount of $75,000,000, and common stock to the amount of $80,000,000. The fixed charges on these securities will be only $6,052,660, which is considerably below the average net earnings of the last five years, which amount to $7,801,645, and thus brings the new stock nearer to the prospect of an occasional dividend. Of the various interests involved the old stockholders bear the worst burden under the reorganization, and justly so, for the day has fortunately gone by when the owners of a property that had gone to ruin could rebuild it to their own advantage to the exclusion of the debtors. The assessments are very heavy, $10 on the preferred and $15 on the common stock. The speculative nature of the holdings of junior bondholders is recognized by turning part of their securities into the new preferred stock. The senior bondholders are really not disturbed in their securities, the exchange for new securities amounting to little more than a change of name. In its broad outlines this is the scheme for the financial reconstruction of the company.

The immense requirements of ready money for the property are guaranteed by a syndicate which agrees to provide $45,000,000 for the reorganization, out of which about $5,000,000 is to be used immediately to put the property in better physical condition. A conservative estimate places the actual cash requirements for the whole reorganization at not less than $30,000,000.

The various conflicting bondholders' committees have fortunately joined in recommending the adoption of this plan and this practically insures its success. After all, the great aim is to bring some sort of order and simplicity out of the financial tangle and thus preserve the integrity of the property. "As it now stands," the committee says, "the system, in its form of incorporation and capitalization, is a development without method or adequate preparation for growth. Scarcely any single security is complete in itself. The main line mortgage covers neither feeders nor terminals. The terminal mortgages may be bereft of their main line support. The branch lines are dependent on the main line for interchange of business and the main line owes a large part of its business to the branch lines." In view of this situation a voting trust is established with a lifetime of five years and a membership of five, a provision which assures an independent and efficient management of this big property during the early years, when it is trying to work back to a condition of genuine prosperity.

February Accidents.

Our record of train accidents in February, given in this number includes 34 collisions, 91 derailments and 4 other accidents, a total of 129 accidents, in which 37 persons were killed and 107 injured. The detailed list, printed on another page, contains accounts only of the more important of these accidents. All which caused no deaths or injuries to persons are omitted, except where the circumstances of the accident, as reported, make it of special interest.

These accidents are classified as follows:

COLLISIONS:	Rear.	Butting.	Crossing and other.	Total.
Trains breaking in two	2	0	0	2
Misplaced switch	1	1	1	3
Failure to give or observe signal	4	1	1	6
Mistake in giving or understanding orders	0	3	0	3
Miscellaneous	2	1	2	5
Unexplained	3	3	9	15
Total	12	9	13	34

DERAILMENTS.			
Broken rail	3	Animals on track	1
Defective bridge	2	Landslide	5
Defective switch	1	Washout	2
Broken wheel	7	Flood	1
Broken axle	8	Malicious obstruction	2
Broken truck	3	Accidental obstruction	4
Fallen brakebeam	2	Ice	1
Boiler explosion	1	Wind	1
Misplaced switch	1	Unexplained	42
Careless switching	1		
Unfastened switch	1		
			91

OTHER ACCIDENTS.	
Boiler explosion	1
Broken side rod	1
Various breakages of rolling stock	2
	4
Total number of accidents	129

A general classification shows:

	Collisions.	Derailments.	Other accid's.	Total.	P. c.
Defects of road	0	6	0	6	5
Defects of equipment	2	21	4	27	20
Negligence in operating	17	5	0	22	17
Unforeseen obstructions	0	17	0	17	13
Unexplained	15	42	0	57	45
Total	34	91	4	129	100

The number of trains involved is as follows:

	Collisions.	Derailments.	Other accid's.	Total.
Passenger	18	30	3	51
Freight and other	44	61	1	106
Total	62	91	4	157

The casualties may be divided as follows:

	Collisions.	Derailments.	Other accid's.	Total.
Killed:				
Employees	15	17	3	35
Passengers	0	0	0	0
Others	0	2	0	2
Total	15	19	3	37
Injured:				
Employees	29	25	0	54
Passengers	23	26	0	49
Others	0	4	0	4
Total	52	55	0	107

The casualties to passengers and employees, when

divided according to classes of causes, appear as follows:

	Pass. Killed.	Pass. Injured.	Emp. Killed.	Emp. Injured.
Defects of road	0	8	0	3
Defects of equipment	0	9	6	0
Negligence in operating	0	23	17	37
Unforeseen obstructions and maliciousness	0	9	7	9
Unexplained	0	0	5	5
Total	0	49	35	54

Twenty-six accidents caused the death of one or more persons each, and 24 caused injury but not death, leaving 79 (61 per cent. of the whole) which caused no personal injury deemed worthy of record.

The comparison with February of the previous five years shows:

	1896.	1895.	1894.	1893.	1892.	1891.
Collisions	34	43	37	84	85	53
Derailments	91	92	65	117	115	93
Other accidents	4	8	3	13	12	10
Total accidents	129	143	105	214	212	196
Employees killed	35	13	14	45	37	52
Others killed	2	5	1	14	7	9
Employees injured	54	75	45	127	55	161
Others injured	53	44	13	176	28	114
Passenger trains involved	51	72	38	83	79	85
Average per day:						
Accidents	4.45	5.11	3.75	7.64	7.31	7.00
Killed	1.28	0.64	0.54	2.11	1.52	2.18
Injured	3.69	4.25	2.17	10.82	3.55	9.82
Average per accident:						
Killed	0.59	0.12	0.14	0.27	0.20	0.30
Injured	0.83	0.83	0.55	1.41	0.48	1.40

No passenger was killed in a train accident in February, so far as we can discover, though there were a half dozen bad accidents to passenger trains, in one of which, a butting collision at Dongola, Ill., five persons were killed. Near Georgeton, Col., on the 9th, a passenger train was overturned by the wind, a mishap which seems likely to recur with considerable regularity as long as narrow gage railroads continue to run top-heavy cars. A passenger train that was derailed on a trestle near Macon, Ga., by the malicious loosening of a rail, landed very fortunately, and only a few persons were injured; but the cars came near being crushed a few minutes later by a second train, a freight, which was wrecked at the same pitfall.

While disasters to passenger trains were not unusually numerous in February, the death record is large nevertheless, the total number of employees killed, 35, being more than twice as large as in February of either of the two preceding years. The most notable disaster to a freight train, aside from the collision at Dongola already mentioned, was the butting collision near Macedon, N. Y., on the 12th, killing three employees. A perusal of the account of this collision reveals a cause for such an accident on a four-track road which would scarcely be guessed by the reader. The money lost by this collision would have paid for changing a good many facing point crossover tracks to trailing points.

Again we have to chronicle two boiler explosions, a class of accident which has been rather common of late.

We have noted accounts in the daily papers of 17 street car accidents in February, in which three persons were killed and 39 injured. There were two collisions and three derailments. One of the derailments was from a broken axle, and one was due to fast running, the speed of the car having been quickened to enable it to penetrate a snow drift. There were half a dozen runaways on steep grades, including one in New York City where the cars are propelled by means of an underground electrical connection, and one in Butte, Mont., where the runaway was a freight car which overtook a passenger car and compelled it to move on against its will. In five of the accidents street cars were struck by locomotives or freight trains, and in one a street car struck an engine.

The New Haven road's proposition for a new passenger station at Boston, outlined on another page, is bold and brilliant. The abandonment of all other schemes does away with many difficulties, but there are three hard problems connected with this one: (1) the great cost of the ground, (2) the complaints of the holders of real estate which will be impaired in value by the abandonment of the existing stations, and (3) the insufficient width of the right of way from Buckingham street (the present crossing of the Providence and the Albany roads) to Albany street. The first one has been met and accepted by the roads, else they would not broach the plan. Evidently they are satisfied to pay a ground rent of $160,000 a year (four per cent. on $4,000,000) to start with. The building, tracks and appurtenances will cost, perhaps, two millions. The total expenditure will be offset in some slight degree by the income from the use of the existing passenger terminals for other purposes. The second problem has been presented at the hearings before the legislative committee. The opposition will be from many different quarters and will probably be strong, but how strong does not yet appear. Nothing very formidable has yet been brought out at the hearings, so far as we have seen from the newspaper reports. On the other hand Mayor Quincy has taken hold of the project with enthusiasm, other city officials favor it, and the Commercial Club, at a dinner where Mr. Clark explained the plans, passed a vote of approval. The actual legitimate cost of the station and necessary changes will be so great that there is no room for suspicion that any one is trying to secure private or wrongful ends in the matter. The third problem looks, at this distance, almost insurmountable. The Boston & Albany has in this location two main and two side tracks, in a deep walled cut, lined on both sides by solid rows of brick buildings. The prospectus seems to assume that all the passenger trains of these two four-track roads can get over this mile on two tracks, the other two being given up to the Boston & Albany for freight. The freight traffic, being that to and from the freight houses and, practically, nothing else, can, however, be partially suspended for an hour or two morning and evening, thus giving the passenger trains four tracks in the busy hours. Perhaps this is what will be done. No other solution seems practicable. The real estate necessary for an additional track at the same level would cost enormously; an overhead track would interfere with streets that now cross above the tracks, and a depressed grade would be subject to inundation. The present grade is below tide some of the way. The track rental, which the New Haven would pay for this part of the line, seems to be about the only direct benefit the Boston & Albany will receive by the change, though the fact that its Back Bay station will be on an equality with that of the other road, as regards nearness to the Common, may in the long run help its suburban business. The Albany officials say that they entered the scheme reluctantly, which we may well believe, for if the people of Boston had not been put up, by this scheme, to demand that the road run its trains further into the city, they would have been obliged, sooner or later, to let the terminal be moved out of the city some distance; that is, beyond Dartmouth street, a change which would be much less costly for the road.

A most unpleasant feeling exists among Colorado railroad managers as an outgrowth of the war over the coal trade. For several years Denver has been almost exclusively supplied by the lignite coals of Boulder and Weld counties, about 40 miles northwest of Denver, and the Union Pacific, Denver & Gulf has had the business to itself. Last year the earnings of the railroad from that business amounted to $327,000. This winter the Atchison, which operates coal mines in the Canon City district, 160 miles south of Denver, determined to enter the Denver market, and accordingly made a rate which permitted the Canon coal to be sold at an advance of but 50 cents over the price of lignite coal. Being superior in quality, the Canon coal soon secured the bulk of the Denver trade. A war in prices ensued, which was participated in by both the coal companies and the railroads. Receiver Trumbull, for the Gulf, finding that the Atchison would not agree in conference to raise the differential, determined to drag in all the railroads, so that the Atchison would be forced to compromise the difficulty, and he ordered a cut in passenger rates between Denver and all Colorado common points, attempting at the same time to cut the eastbound rates to the Missouri River also. In the latter effort he failed and the passenger war suddenly ended. Last week he again started the passenger rate war and now fares are again demoralized. This has been a most serious blow to the Denver & Rio Grande, which does the bulk of the passenger business between the principal Colorado common points. It injures the Atchison but slightly, and does not hurt the Gulf materially, as that line has practically no local passenger trade between the common points. President Jeffery, of the Denver & Rio Grande, has been very caustic in his public utterances upon the conduct of Receiver Trumbull. The indications are that the lignite coal business must inevitably adjust itself to the new conditions of strong competition from the southern Colorado coalfields, and that will mean a serious falling off in the earnings of the Union Pacific, Denver & Gulf, from that particular business. It is rumored, as another cause for ill-feeling between managements, that Receiver Ristine, of the Colorado Midland, is preparing to abandon the use of the Atchison tracks between Colorado Springs and Denver and enter into a trackage contract with the Gulf, which may account for the hostility of the Atchison to the Gulf and its determination not to agree upon a differential upon the coal tariffs.

All of the railroads running to the Pacific coast, except the Canadian Pacific, have agreed upon the main features of a new Transcontinental Traffic Association, representatives of the roads having met in New York City last Monday. No Commissioner has yet been chosen, but Mr. R. H. Countess is Secretary of the Association, and it is said that he is likely to be Commissioner. The principal discussion at the meeting was concerning the chief object of the Association, which is, to agree upon the basis which shall be followed by the railroads in apportioning among themselves the burden of a subsidy to the Pacific Mail Steamship Company. According to the New York reporters, this matter is to be managed as in former years, the railroads agreeing to guarantee the steamers the sum of $72,500 monthly. It is said that the Pacific Mail and the Panama Railroad have agreed to divide this sum in the proportion of 45 per cent. to the Pacific Mail and 55 per cent. to the Panama. This joint subsidy, which was in force for a considerable time after the law against pooling went into effect, and which was stopped because the parties could not agree, and not because of any trouble with the Department of Justice, affords a fine illustration of the narrowness of the law referred to, and its insufficiency to carry out the aims of its framers. In spirit this subsidy is essentially a pool. Each road contributes to it according to the amount of its business, as compared with the other roads' business, and the money is paid for the purpose of mitigating the evils of severe competition, the same as in the case of a pool; in fact this is the same thing as a pool between A (the railroads) and B the steamers). But the steamers are not subject to the law; the railroads, as between themselves are not pooling in the technical sense, and no one seems to regard the subsidy as an infraction of law. Still, as the New York *Herald* says, "it might be charged that the agreement is a violation of the law, inasmuch as the effect of the arrangement is to abolish competition." It is believed, however, says the *Herald*, with its customary naïveté, "that a way will be found that will at least appear on the face of it to be legal."

The application and appointment of Receivers for the Central Vermont was in the nature of a surprise to the officials of that road and to the public generally, for it was supposed that the Grand Trunk was satisfied with the existing arrangement. It has been known on the inside for some time that the latter was gradually acquiring control of the Central, but it was not expected that suit would be instituted. It is given out that the suit is a friendly one and intended to promote only the best interests of the property, which is probably true; but the result is likely to be that the reorganization will be in the interest of the Grand Trunk, and the independence of the road largely surrendered, if, indeed, its management does not become entirely merged in that of th Grand Trunk. The Central Vermont has been operated economically, and has shown itself capable of earning its fixed charges, but it has been unfortunate in being obliged to carry a load which is a heritage of the long and expensive litigation with which the property was cursed for so many years.

The Corliss bill concerning sleeping car rates will be the subject of a hearing before the House Commerce Committee, at Washington, April 14. Mr. Corliss has amended the bill in important particulars. The clause prescribing a charge for seats in parlor cars has been eliminated, as has the section making it unlawful for porters or other employees to receive tips. The section relating to the price of berths has been changed, so as to require the price of an upper berth to be not over three-fourths the price of a lower berth, and that part of the bill making it obligatory to close the upper berth when only the lower berth is sold has been stricken out. Congressman Corliss believes that the bill as now amended and shorn of the sections that were most objectionable to the sleeping car companies will go through. The bill as it now stands provides for no specific rates, the requirement of a difference in the price of upper and lower berths being its main feature.

A committee appointed by the Directors of the Atchison has just completed a trip of inspection over the St. Louis & San Francisco road. They were accompanied by several capitalists who hold large amounts of the St. Louis & San Francisco bonds, and who will have considerable to say regarding the reorganization of the property. The report of this committee will be presented to the Atchison board at its next meeting, when a decision is likely to be reached as to the advisability of reorganizing the 'Frisco in the Atchison interests. The only question to be considered appears to be one of price to be paid for the bonds now in the hands of outside parties. The court has extended until April 15 the time under which an agreement may be reached and proceedings taken under the reorganization plan of the Atchison. If no agreement is reached by that time a decree of foreclosure will be entered.

Pennsylvania State Railroad Report.

Hon James W. Latta, Secretary of Internal Affairs of the State of Pennsylvania, has issued his annual report, Part IV., for the department of railroads, canals, telegraph and telephone companies. This is official document No. 8 and is prepared by Mr. Isaac B. Brown, Superintendent of the Railroad Bureau. It is for the year ending June 30, 1895.

In Pennsylvania, as almost everywhere, the railroads are slow in making their reports, and Mr. Brown makes the usual complaint. Last year he fined a road $5,000 for failure to report, but it was finally decided to remit the fine, the delinquent officer having been discharged by the railroad company. This deparment has now fully adopted the blank provided by the Interstate Commerce Commission for the annual reports of railroads. Mr. Brown endeavors to tabulate the railroad information in the best manner, but states that he has a very insufficient clerical force. About 40 pages of the report are taken up with reviews of the statistics of the roads, under the usual heads. Under the head of equipment Mr. Brown inserts a long essay arguing against the private car abuse.

On account of the rapid changes in street railroad affairs in Pennsylvania during the past five years Mr. Brown finds the statistics unreliable. Many companies have been leased, sold or merged into others either without record or in such a way that the Commissioner can get no accurate account of what has been done. A revised blank will be furnished to the companies for the current year, and it is hoped that reliable information will be secured.

The reports of the railroads, printed at length, fill 585 pages, and those of street railroad, canal, telegraph and telephone companies 40 pages. The principal figures from the reports of the (standard) railroad companies are tabulated by the commissioner, enabling the reader to readily compare one road with another. The total length of railroad operated in the state is 9,762 miles, 70 miles more than the year previous.

The legislature of Pennsylvania passed seven acts in

1895 relating to railroads. One, approved May 15, authorizes street railroads, not on township or country roads, to make contracts with power companies. Another authorizes traction or motor power companies to sell or lease to each other. A third authorizes these companies to operate all their lines as a general system, lay out new routes, etc. A law approved May 21 enlarges the rights of street railroad companies and allows them to carry United States mails. A law approved May 22 amends the act of May 6, 1844, regulating proceedings before the courts in the matter of securing right of way for railroads.

TECHNICAL.

Manufacturing and Business.

The Kennedy Automatic Gravity Link & Pin Car Coupler Co. was recently incorporated in Colorado. George M. Dunn is President; H. T. E. Wendell, Vice-President; Sidney H. Dent, Secretary; and Frank L. Woodward, Treasurer.

The Chicago Pneumatic Tool Co. has been compelled by increasing business to lease larger offices and is now located in Rooms 1020 and 1021 in the Monadnock Building, Chicago, instead of Room 1553.

The Sterling Emery Wheel Manufacturing Co., of Tiffin, O., has been running its factory on full time for a long time past. The company reports a large increase in orders for its emery and corundum wheels and grinding machinery, the orders showing an increase not only in number, but in the amount of material ordered.

Watson & Stillman, of New York, have received an order for the building of 15 draw benches for bicycle, tube manufacture, each of them with a stroke of 18 ft.

B. M. Everson, 301 Smithfield street, Pittsburgh, has for sale besides other cars and locomotives, a Baldwin compound 10-wheel engine with cylinders 14 in. and 24 × 24 in. and weighing 133,000 lbs. The engine has been in use only one year, and since it has been taken out of service has been thoroughly overhauled, and is adapted for passenger or fast freight service.

The Boston Belting Co. has leased larger offices for its New York branch, which after April 1 will be located at 100 Reade street.

The Brown Hoisting & Conveying Co., of Cleveland O., has recently sold to the Battle Creek Steam Pump Co. one of its standard overhead tramrail systems of one ton capacity, including switches, curves, roller bushed trolleys equipped with triplex blocks, etc., and a light pulley block traveling crane. The company has also sold an extensive two-ton tramrail system, including turntables, etc., to the Detroit Dry Dock Co., for the new shops in the ship yards at Wyandotte, Mich.

The plant being erected at Birmingham, Ala., by the Birmingham Car Wheel Works, will probably be ready to start up next month. The plant will employ at first about 100 men, and in another year the capacity will be doubled. It is being erected by N. S. Bouton and associates.

The improvements to be made this year by the Cambria Iron Company call for expenditures ranging from $500,000 to $800,000. The company, March 16, declared a dividend of 2 per cent., payable April 1.

The Providence Steam Engine Co., of Providence, R. I., builders of the improved Green engine, report their shops full of work. The Green engines are especially adapted for direct connected electric railroad work, and recent contracts for this line of work cover one 500-H. P. and one 350-H. P. tandem compound engine for the Suburban Railroad Co., Chicago; two 750-H. P. tandem compound engines for the Second Avenue Traction Co., Pittsburgh; two 400-H. P. simple engines for the street railroad at New London; one 300-H. P. simple engine for the Hampton & Old Point Railroad, Hampton, Va.; two 700-H. P. for the Washington, Alexandria & Mt. Vernon road at Washington, D. C.

The Chicago Grain Door Co., of Chicago, has moved its office to No. 931 Monadnock Block, Chicago.

The business of the Sterlingworth Railway Supply Company, of which Mr. F. W. Coolbaugh is President, has developed so rapidly during the last year that a plant for the manufacture of its equipment specialties has been found necessary. The place selected for this plant is Easton, Pa., and it is now in course of construction. It will be completed by the first of June.

Mr. W. W. Young has been appointed Eastern Agent of the Union Switch & Signal Company, with office at No. 1301 Havemeyer Building, New York City, as successor to Mr. John T. Cade, resigned.

Messrs. S. T. Wellman, J. W. Seaver and C. H. Wellman have associated themselves under the name of the Wellman, Seaver Engineering Co., with offices at the New England Building, Cleveland, O. They have associated with them the well-known metallurgist and chemist, Mr. Geo. W. Goetz, of Milwaukee. They expect to make specialties of the following lines of construction: Bessemer and open-hearth steel plants, manufacturing and mill buildings, coal-handling and storage plants. They are the owners of the Wellman patent rolling open-hearth steel melting furnace, also of the Wellman patent method and machine for charging open-hearth furnaces. They own the exclusive right to manufacture the Seaver patent coal elevator.

Iron and Steel.

The Glendon Iron Company, one of the oldest concerns of its kind in the Lehigh Valley, made an assignment on March 23 for the benefit of creditors, naming as the assignees J. Tatnall Lea, of Philadelphia, and Francis C. Gray, of Boston. The company's plant is capitalized at $1,000,000.

The Joliet mill of the Consolidated Steel & Wire Company was destroyed by fire on March 23. The total loss is reported to be $150,000, covered by insurance. This is the second fire at this mill within a year.

Press reports say that an order for 5,000 tons of 60-ft. rails has been placed with the Carnegie Steel Co. by the Pennsylvania Railroad. They will be used on the Pittsburgh Division.

William Shaw, Receiver of the Gilbert Car Manufacturing Co., of Troy, N. Y., announces that he will apply to the New York Supreme Court at Troy, N. Y., on April 4, for the appointment of a Referee to pass upon his accounts as Receiver, and for his final discharge upon the return of the Referee's report, and the distribution of the moneys in his hands as directed by the Court.

New Stations and Shops.

Plans for a new station at Monticello, N. Y., to be built by the Port Jervis, Monticello & New York road, have been completed. The building will be of wood, about 50 × 20 ft., with a platform 180 ft. long, of which 120 ft. will be covered. Childs & De Gott, of 67 New street, New York City, are the architects.

The shops of the Pittsburgh & Lake Erie, at McKee's Rocks, near Pittsburgh, have been very busy for some time past, and it is stated that all departments will be run on full time until May. About 10 engines are now in the shops undergoing general repairs, and it is said that 15 other engines will be sent to the shops for a general overhauling. About 100 freight cars are also awaiting general repairs.

The contest which has been going on for some years between the cities of London and Brantford, Ont., for the location of the principal car shops of the Grand Trunk seems to have been settled by the Provincial Parliament last week in favor of the latter city. The shops employ about 400 men and were formerly located at London. Since their removal to Brantford there has been active agitation to have them restored to London and the railroad company is said to have agreed to this if certain conditions in regard to the land for the site of the shops at London were agreed to by the city. When the bill authorizing the removal to London was reported in the Provincial Parliament at Toronto last week it failed to pass. This action seems to assure the location of the shops at Brantford.

The plans for the new office building for the Norfolk & Western at Roanoke, Va., are now completed and work upon the structure will begin in April. The new building will be much larger than the old one which was burned during the winter. It will be 65 ft. × 188 ft. and six stories high, containing 90 rooms altogether. The basement story will be of stone and the material above this will be of brick made along the line of the road in Ohio and buff and brown in color. The building will have two passenger elevators, will be heated by steam and wired for electric and piped for gas lights.

The Naval Appropriation Bill.

In the bill prepared by the House Committee on Naval Affairs, providing for new ships for the navy, the general features of which we gave last week, it is provided that one of the four battle-ships recommended and one torpedo boat shall be built on the Pacific coast, one torpedo boat on the Gulf, and one on the Mississippi River. Five of the torpedo boats are to have very high speeds, and the remaining 10 somewhat lower speeds. The five will be larger boats resembling the English torpedo destroyers. The boats to be constructed on the Pacific coast, the Gulf and the Mississippi are to be built at these points, if the cost of construction is not "excessive." In case it is excessive, they are to be built wherever the President may decide. The committee completed the bill and authorized Mr. Boutelle to report it to the House. It was decided by a vote of 7 to 4 to strike all provision for dry-docks out of the bill.

Launch of a Lake Vessel.

There was launched March 23 at Nixon's shipyard, at Elizabethport, N. J., the first of a fleet of thirteen steel vessels, which are being built for service on the great lakes. The entire fleet is to be ready for service this season, and although the bad weather of the last three weeks has delayed work upon them, three more vessels will probably be launched this week.

Pantasote as a Substitute for Leather.

The Franklin Institute on Dec. 9, 1895, awarded to the Pantasote Leather Company, of New York, the Edward Longstreth medal of merit, this action being taken in view of the report of the Committee on Science and the Arts, which report characterizes Pantasote as "a highly meritorious substitute for leather for a number of uses for which leather is adapted," and "that it is the best substitute for leather for these purposes that has thus far been placed upon the market." The committee above referred to made an investigation of the various substitutes for leather now in use, extending over more than two years. They corresponded with many makers of car and other furniture and car curtains, builders of carriages, boats, ships, etc., from whom replies regarding Pantasote were uniformly favorable, and indicated that as a substitute for leather in upholstery and carriage work it is the best that is known. The report of the committee contains a description of the method of making Pantasote, this name including fabrics of various kinds intended to replace leather in upholstering, carriage furnishing, book binding, trunk and bag making, wall decoration, etc. The method of manufacture is in brief to coat the surface of paper and leather fabrics of various kinds with a composition which becomes incorporated with the substance of the fabric, this gum being colored before it is spread on the fabric. The report brings out the fact that the Pantasote fabrics possess some desirable qualities which leather does not, such as their durable pliability under continued influence of extreme cold and heat, their indifference to water, fresh or salt, and the fact that they may be scrubbed to remove dirt or grease.

A Long Mining Tunnel.

Orman & Crook, railroad contractors of Colorado, have secured a contract to run a mining tunnel under the Cripple Creek mining district for a distance of 5,000 ft.

M. C. B. Association Standards.

The committee on supervision of the standards and recommended practice of the Association has sent out a circular asking for suggestions in reference to any such modifications of the established standards and recommended practices of the Association as are justified by experience in their use. All the standards and recommended practices are enumerated in the circular, although it is anticipated that many of them will be perpetuated without modification. Such suggestions as have already come to the notice of the committee are referred to. We reprint a portion of the circular.

1. Journal box and details, for journal 3¾ × 7 in. (page 410, sheets 1, 2, 3). *Suggested*, that the dust guard shown by sheet 1 for this journal box and that shown by sheet 4 for the large journal box ought to be the same in general design; *suggested*, that on sheet 3 a note should be added under the illustration of the box lid somewhat as follows: "The lid spring may be of any design and may be secured to the lid by any practicable method, provided that the designated section (2 × ⅛ in.) is adhered to." *Suggested*, that on sheet 3 a note should be added under the illustration of the wedge somewhat as follows: "Skeleton wedges of malleable iron or steel may be used, provided the essential dimensions are adhered to."

2. Journal box and details for journal 4½ × 8 inches (page 410, sheets 4, 5, 6). *Suggested*, that the dust guard shown by sheet 4 for this journal box and that shown by sheet 1 for the small journal box ought to be the same in general design. *Suggested*, that on sheet 6 (as on sheet 3) a note should be added under the illustration of the box lid somewhat as follows: "The lid spring may be of any design and may be secured to the lid by any practicable method, provided that the designated section (2 × ⅛ in.) is adhered to." *Suggested*, that on sheet 6 (as on sheet 3) a note should be added under the illustration of the wedge somewhat as follows: "Skeleton wedges of malleable iron or steel may be used, provided the essential dimensions are adhered to."

8. Brake and shoe (page 411, sheet 8). *Suggested*, that the lower bridge lug of the brake head ought to be re-enforced by two brackets similar to the brackets, *F F*, by which the upper bridge lug is re-enforced. *Suggested*, that a rib should be added to the outer edge of the shoe to give it increased stiffness and strength and to secure increased wear from its use. *Suggested*, that the taper of the tread of the shoe should be made exactly the same as the taper of the tread of the wheel; this would be accomplished if the thickness of the inner edge of the shoe were increased from 1⅝ in. to 1⅞ in., the thickness of the thicker edge of the shoe remaining 1⅛ in. as now.

10. Air-brakes, general arrangements and details (page 411, sheet 9). *Suggested*, that the words, "All pins turned to 1⅜ in. diameter," should read, "All pins finished to 1⅜ in. diameter"; this would permit of the use of cold-rolled pins. *Suggested*, that the words, "All rods ¾ in. diameter," should read, "All rods at least ¾ in. diameter," as the connection between the cylinder lever and floating lever ought, in general, to be more than ¾ in. diameter. *Suggested*, that the dimensions of the truck lever connection shown at the foot of sheet 9 are not such as to secure a malleable casting of proper strength, and ought to be modified. *Suggested*, that on sheet 9, under the title reading "Standards for Air-Brakes on Freight Cars," a note should be added reading, "In so far as the construction of the car will admit of their use."

12. Automatic coupler (page 412, sheet 11). *Suggested*, that the design of coupler on sheet 11 ought to show the distance from back of knuckle to back of horn of drawhead as being 8¾ in., as it is of great importance that all couplers should be made uniform in this respect. *Suggested*, that the carrier iron shown on sheet 11 conflicts with that shown by sheet B of recommended practice; that the illustration of the carrier iron on sheet 11 should be omitted, and that the last clause of the text on page 412 should be modified to read: "In 1889, the association decided that the opening in carrier iron where drawhead enters should be 5¾ in. vertically and 5½ in. horizontally."

29 Buffer blocks and location (page 423, sheet A). *Suggested*, that buffer blocks on freight equipment cars should be placed 26 in. apart, center to center, instead of 22 in. as now, making it unnecessary to cut away the corners of the buffer blocks to clear the guard arm of the M. C. B. coupler, and making the spread of the buffer blocks on freight equipment cars the same as the usual spread of buffer stems on passenger equipment cars.

31. Attachment of couplers to cars (page 424, sheet B). *Suggested*, that with the dimensions given it is impossible to obtain a draft spring of more than 20,000 lbs. capacity (the standard reads 22,000 lbs.), and that, therefore, the standard requirements ought to be reduced from 22,000 lbs. to 20,000 lbs.

32. Loading logs, poles and bark on cars (page 424, sheet B). So many different suggestions have been made that the Committee on Standards advises the appointment of a special committee to investigate this subject and to report at the convention of 1897.

39. Air-brake and signal instructions. These are not included among either the standards or recommended practices of the Association as given in the *Proceedings*, but are embodied in a separate pamphlet, entitled "Air-Brake and Signal Instructions as Approved by the Master Car Builders' Association and the American Railway Master Mechanics' Association, June, 1892." *Suggested*, that these air-brake and signal instructions need to be revised, and that, therefore, the Association should appoint a special committee and should request the Master Mechanics' Association to appoint a similar committee, with the understanding that these two committees, working as a joint committee, should revise these air-brake and signal instructions, and should submit the revision to the two associations at the conventions of 1897.

The committee are Messrs. R. H. Soule, G. L. Potter and A. M. Waitt. Address replies to R. H. Soule, Superintendent Motive Power, Norfolk & Western Railroad, Roanoke, Va.

The Union Elevated Loop, Chicago.

The permit for the erection of the superstructure of the Wabash avenue side of the loop has been obtained from the Commissioner of Public Works, and it is expected that the work will progress rapidly. The traveler has been put in position on the Lake street stub at Wabash avenue. The permit gives the company a right to build from a connection with the Lake Street Elevated at Wabash south to Harrison street, and the pier foundations are already in place. The plans and specifications call for stations at Randolph, Washington, Madison, Adams and Congress streets, but it is likely that other stations will be built.

Electric Switching on the Brooklyn Bridge.

The trustees of the New York & Brooklyn Bridge met on March 23 and adopted a report of Superintendent Martin recommending that electrically equipped cars be used hereafter for switching trains at the bridge terminals. It is probable that contracts for equipping 20 cars with electric motors, and for building a power-house and completing the other details of the installation, will be let in April, and if this is done it is probable that the new system will be in operation some time next fall. The experimental car had four motors of 50 H. P. each, but these will be replaced by motors of 62½ H. P., each motor to give a drawbar pull of 1,500 lbs. It is thought that cars so equipped will easily draw trains of four loaded cars across the bridge in case of accident to the cable or in the early morning hours when the cable is not running. The Superintendent was instructed to prepare plans and specifications for the power-house and for the other details of the installation. He was also instructed to advertise for bids for electric heaters for these cars. The Executive Committee of the trustees has recommended that the contract for the electric motors be awarded to the General Electric Company on its bid of $3,645 a car. The cost of the power-house and the machinery is estimated at $300,000.

Steel Forgings.

The Western Society of Engineers desires to secure very full discussion of subjects which will prove of general interest to its members and others interested in engineering work. The first subject taken up for discussion was that of "Hydraulic Cements," and it brought out a great deal of valuable information. The second subject selected is that of "Steel Forgings." All discussions sent to the society will be published in the *Journal*. We append a list of questions which has been prepared in regard to "Steel Forgings." The questions are submitted as suggestions, and discussion is desired. It is desired to obtain for publication the fullest and most practical information possible. Discussion should be in the hands of the committee not later than April 30. When published it will be sent to all persons who contribute any material. Very full discussion from a number of manufacturers and engineers who are in possession of valuable information has been promised. The questions follow:

1. Are there any advantages of steel over wrought iron forgings? If so, what are they?
2. Are forgings made from open hearth steel superior to those made from Bessemer steel? If so, why?
3. Is there any difference for practical uses between forgings made from basic and acid steel?
4. What methods have been found to give most satisfactory results in producing solid and homogeneous ingots from which forgings are to be made?
5. Should steel forgings be made under separate and distinct methods of treatment from wrought iron forgings?
6. What are the relative merits of hammered forgings and those forged under a press?
7. Should there be any treatment of forgings subsequent to forging and before machining? If so, what?
8. What is the effect of simple annealing of forgings and also of tempering and subsequent annealings?
9. What is the best form of specification for machine and engine forgings where the surface is finished and subjected to wear?
10. What is the best form of specification for drop hammer rods, stamp stems and other similar forgings which are subjected to shock and vibration?

Answers should be sent to the Western Society of Engineers, 1737 Monadnock Block, Chicago, Ill.

International Exhibition of Motors and Motocycles.

An international exhibition of motors and their application to driving carriages, cars and cycles, as well as stationary motors with appliances and inventions to be used in connection with them, will be held under the direction of the Motor Car Club during May, June, July and August next, at the buildings of the Imperial Institute in London. The exhibition will open on May 9, and daily practical tests of the various devices will be made. Advantage will be taken of this special opportunity to enable British, colonial and foreign makers of motor carriages, cycles, etc.; and of motors, whether driven by oil, steam, electricity, compressed air or otherwise, to display their productions and demonstrate the value of the same to the public. The special aim of the exhibition will be the display of recent developments in self-propelled vehicles. One gold and three silver medals and diplomas will be awarded to such exhibitors in each department as may be deemed entitled to them. Suitable buildings will be provided in the grounds of the Imperial Institute for the purposes of this exhibition.

The exhibition includes 15 sections, among which will be found besides every variety of self propelled vehicle; self propelled plows and other agricultural implements; apparatus for aerial navigation, cycles and vehicles which while not self propelled, embody some novel principle of construction; various appliances for use with self propelled vehicles, knapsacks, cooking appliances and other tourists' conveniences; launches, yachts and boats propelled by various kinds of motors, lamps and similar appliances for various uses; watches, clocks, compasses, pedometers, etc., stationary engines, dynamos and motors.

The latest date for the reception of exhibits is Monday, April 27. Requests for space should be sent to the Secretary of the Motor Car Club Syndicate, Limited, 40 Holborn Viaduct, E. C. Applications for space should be sent in not later than March 31.

Water Tube Boilers in the Dutch Navy.

Messrs. Yarrow, at Poplar, recently tested three water tube boilers which have been constructed for the Dutch Government. These boilers are to form part of a dual system of water tube boilers combined with ordinary return tube boilers, for three cruisers at present being built in Holland. Each vessel will have engines developing 9,250 indicated horse power. Steam sufficient for 2,250 H. P. will be supplied by two large cylindrical boilers of the ordinary return tube type. This will be sufficient for ordinary cruising purposes, but when higher speeds are required the water tube boilers will be brought into use. There are eight of the latter, and they are estimated to give collectively steam for a total of 7.000 indicated horse power. The two cylindrical return tube boilers in each vessel weigh 120 tons. The eight water-tube boilers in each ship weigh 88 tons, or 11 tons each. It will be thus seen that with water tube boilers nearly three times as much steam will be obtained with an expenditure of only 88 tons in weight as would be given off by 120 tons of the ordinary marine type of boiler. In regard to space occupied in the ship, each of the cylindrical boilers is 13 ft. in diameter and 10 ft. 6 in. long. The water tube boilers are 9 ft. 3 in. wide and 9 ft. 3 in. high. —*The Practical Engineer.*

THE SCRAP HEAP.

Notes.

The Lehigh Valley announces that its new fast trains between New York and Buffalo will start about noon. The first car will have a 19-ft. baggage compartment, next a smoking room, then a kitchen and at the rear end a regular dining room, seating 16 persons. A prize of $25 is offered for a suitable name for the trains.

The falling off in freight business within the last two or three weeks has been quite general and the Pennsylvania, the Union Pacific and one or two other roads have reduced the time of shopmen and retrenched in other ways.

The suit for $800,000, which was begun in 1892 against the Grand Trunk by Swift & Co, the Chicago packers, has been dismissed, a settlement having been reached out of court. The firm charged discrimination in freight rates in favor of rival packers from 1887 to 1889. The case was tried once in 1894, and the jury disagreed.

Some weeks ago we noted the fact that one of the car ferry-boats running between Conneaut, O., and Port Dover, Ont., was fast in the ice. This vessel was safely extricated, but her sister vessel was caught in the ice about the same time, and was held there for about six weeks. This vessel, the No. 1, was released last Saturday.

The General Passenger Agents' Association, at its semi-annual meeting in Richmond last week, adopted a resolution to the effect that unlimited tickets, either local or interline, ought to be entirely withdrawn, and a committee was appointed to lay the matter before the various traffic associations. It was also resolved that hereafter the Secretary gather subjects for discussion at the semi-annual meetings and send a list of them to members thirty days before the meeting.

The New York Supreme Court has ordered Cornelius Vanderbilt, W. K. Vanderbilt, Frederick and George W. Vanderbilt, and other heirs of Commodore Vanderbilt, to produce the books and accounts showing the earnings of the steamers Seabird, Daniel Webster, Independent and Pacific more than forty years ago, that is, since the year 1853. The order was made in the suit of William H. A. Brown, administrator for the settlement of an agreement between W. A. Brown and Commodore Vanderbilt, March 21, 1851, by which Brown was to run his vessels from San Francisco to San Juan del Sul, to connect there with the vessels of Vanderbilt.

The New Jersey Legislature has passed Senator Voorhees' bill for the abolition of grade crossings in Jersey City and Newark. It requires the city to bear the expense of vacating streets, removing sewer, gas and water pipes, and depressing the streets where necessary, while the railroads are to pay for all the work on their right of way except the pipes mentioned The Boards of Works of the cities are to initiate the proceedings by declaring the change of grade necessary, and the Justice of the Supreme Court of the district is to give a hearing to both sides, and if the work is deemed necessary shall appoint three Commissioners to prepare plans and take charge of the work.

Bibles on the Katy.

From an item under the above head, in a Western paper, we learn that hereafter a Bible will form part of the furnishings on the cabooses on the Missouri, Kansas & Texas freight trains in the state of Texas. The books were supplied by the Women's Christian Temperance Union of Fort Worth, which felt, says the reporter, "that the train crews should have a chance to digest a little moral pabulum while waiting for wrecks to be cleared away or passenger trains to pass. General Manager Allen has issued an order that a Bible shall be placed in a receptacle in each caboose." This is all right, but the reporter seems to ignore the fact that deglutition is a necessary preliminary to digestion.

Rapid Transit in New York.

The suit brought by the New York Sun Printing and Publishing Association against the Board of Rapid Transit Commissioners and others was argued last Tuesday before the Appellate Division of the Supreme Court of New York. The arguments of the appellants only were heard, and further hearing was postponed to Thursday of this week. The argument was chiefly to establish the unconstitutionality of the rapid transit law. Eminent counsel appear on both sides, and this is perhaps the most formidable attack that the enterprise has yet been subjected to.

LOCOMOTIVE BUILDING.

The Richmond Locomotive Works has received an order for engines from the New Orleans & Northeastern Railroad of Louisiana.

The item in regard to the eight engines just leased by the Norfolk & Western from the Railroad Equipment Co., of New York, published in this column last week, should be corrected to read that the engines were built by the Baldwin Locomotive Works, originally, for the Toledo, Ann Arbor & North Michigan road. The Cooke Locomotive & Machine Co. only made a few minor repairs to the engines before shipment to the Norfolk & Western.

CAR BUILDING.

The Toledo & Ohio Central is reported in the market for freight cars.

The Chattanooga Southern road will immediately order 50 cars to be ready for delivery during April.

The Detroit & Mackinac road of Michigan will, it is reported, soon order a small number of freight cars.

Rhodes, Curry & Co., Limited, of Amherst, N. S., are building 14 cars for the Halifax Electric Street Railroad.

The Madison Car Works is reported to have secured the order for building 500 box cars for the Wabash road.

The Ohio River road of West Virginia will shortly give out contracts for building four new passenger coaches.

The Pennsylvania is said to have given an order for an additional 300 coal cars to the Ohio Falls Car Co., and for 100 cars to the Mt. Vernon Car Co.

The Calumet & Blue Island has let to the Haskell & Barker Car Co. an order for 300 34-ft. box cars. They are to have the Haskell & Barker steel truck and metallic roofs.

The Wheeling & Lake Erie car order was given out last week, the United States Car Co. securing the contract for 500, and the Madison Car Works contracts for 250 cars. The cars to be built by the United States Car Co. will be 60,000-lb. coal cars, equipped with Westinghouse air-brakes. Half of the cars will have National Hollow brakebeams, and the other half Monarch brakebeams. Tower couplers will be used on 250 of the cars and Standard couplers on the remaining 250.

BRIDGE BUILDING.

Atlanta, Ga.—Bids will be received until May 6 for an 180-ft. highway bridge over Peach Tree Creek. Address County Commissioners, Fulton County, Ga.

Baltimore, Md.—Bids will be received until March 30 for the cast and wrought iron balustrades for the stone arch bridge on North avenue. Address J. Fisher, City Commissioner.

Beverly, Mass.—The legislature has, it is reported, directed the commissioners of Essex County to rebuild the draw span of the bridge between Salem and Beverly.

Buffalo, N. Y.—The annual report of the International Bridge Company was recently filed with the County Clerk. It shows, capital stock, $1,500,000; debts, $2,057,000.65; assets, $2,109,006.86.

Carlisle, Pa.—The County Commissioners will sell the old bridge at Middlesex, and will place on the site of the old bridge a new iron and steel bridge. Nelson & Buchanan, Chambersburg, have the contract for building the structure.

Chamberlain, S. D.—The President of the United States has approved the act authorizing the construction of a bridge across the Missouri river at or near Chamberlain, S. D.

Chattanooga, Tenn.—It is reported that the Engineer of the county has recommended that an iron bridge be built at Whiteside street, to cost about $11,500.

Chicago, Ill.—We understand that W. D. Kent, Commissioner of Public Works, will ask for new bids for the superstructure of the bridge at North Halsted street and that he has approved the plans of the Illinois Central for overhead crossings of its tracks along the lake front at Harrison, Monroe and Van Buren streets and at Peck Court.

Columbia, Ala.—The House, at Washington, on March 16, passed a bill authorizing the construction of a wagon and foot bridge across the Chattahoochee River at Columbia, Ala.

Denver, Col.—The Engineer of the Board of Public Works has under consideration plans for the erection of a bridge across Cherry Creek on Wazee street. A new bridge may be built on Lawrence street and the old one removed to Wazee street.

Des Moines, Ia.—It is reported that an iron bridge will soon be built over the Raccoon River near this place, to cost about $30,000. The bridge will be built for the Keokuk & Western Railroad, and plans for the same are, it is said, now being prepared.

Easton, Pa.—The County Commissioners last week opened the following bids for erecting a new bridge over the Bushkill Creek, at Tatamy, and removing the old stone bridge at that place. The new bridge will have a steel superstructure and a masonry substructure: King Bridge Co., Cleveland, O., $9,836; New Jersey Steel and Iron Co. Trenton, N. J., $11,720; Scott & Stewart, South Easton, Pa, $9,850; Wrought Iron Bridge Co., Canton, O., $9,567; Groton Bridge & Manufacturing Co., Groton, N. Y., $10,400; Pennsylvania Steel Co., Steelton, Pa., $10,490; Nelson & Buchanan, Chambersburg, Pa., $10,470; Lehigh Construction Co., South Bethlehem, Pa., $10,480. The contract was awarded to the Wrought Iron Bridge Company. The masonry work has been sublet to Scott & Stewart, of South Easton.

Emmetsburg, Ia.—Bids will be received until April 7 for an iron bridge over the Des Moines River. C. W. Hodgkinson is County Auditor.

Godmanchester, Que.—The contract for the stone work in the new steel bridge over the Trout River, between the townships of Elgin and Godmanchester, Huntington County, Que., has been let to J. Tallon for $1,020.

Harrisburg, Pa.—The grand jury has recommended the erection of a county bridge over Lych's Run in Londonderry township.

Hartford, Conn.—A stone arch bridge with a span of 40 ft. may be built at this place during the spring. C. H. Bunce is City Engineer.

Knoxville, Tenn.—Plans for two types of bridge across the river at this place are now on file and bids for the same will be received by the bridge committee of Knox County, Tenn. The plans provide first for a steel bridge of usual design, second for a stone arch bridge which is an engineering undertaking of considerable magnitude. Press reports say that it will be 1,600 ft. long, the span of the main arch being 240 ft., which would make this arch the longest masonry arch in the world. The

height of the center of the arch above the water is planned to be 105 ft. The bridge will have a 50-ft. roadway, and the depth of the ring stones at the center of the arch will be about 8 ft. The entire structure will be built of pink marble quarried near by. The filling of the arches will be of concrete. The estimated cost of the structure is about $1,000,000. The popular sentiment is in favor of the stone bridge.

Leavenworth, Kan.—Bids will be received until April 13 for a bridge over Little Stranger Creek, Sullivan road. J. W. Neihaus is County Clerk.

Lima, O.—Bids will be received until April 2 for a steel bridge over the Ottawa River on East Market street, and for removing the present bridge to a new location on West street. R. H. Gamble is City Engineer.

Lorain, O.—The Secretary of War has given notice that the Nickel Plate bridge over Black River is an obstruction to navigation. The following changes must be made before April 1, 1897. To modify draw to give clear space of not less than 120 ft. wide.

Lowell, Mass.—The Mayor and Aldermen have voted against the construction of a stone arch bridge across the Merrimac River, to replace the Granite street wooden bridge carried away by the flood. A steel bridge will probably be built.

Lykens, Pa.—A committee has been appointed to look into the matter of erecting a bridge over Rattling Creek at Market street.

Media, Pa.—J. B. Rhoades, W. P. Lukens and F. S. Vernon, the viewers appointed to report on a bridge over Chester Creek, at Ninth street, Chester, made a report March 23 in favor of the construction of the bridge by the county. Its estimated cost is about $30,000.

New York.—The Commissioners of the new East River Bridge have decided to take an appeal from the decision of Judge Gaynor granting an injunction against the purchase of the Uhlmann franchise on the terms agreed upon.

Philadelphia, Pa.—The contract to build a skew steel bridge over the Wissahickon, in place of the old red bridge, has been awarded to M. McManus. His bid was $27,743.

Pittsburgh, Pa.—The new south side free bridge was opened to the public last week. This bridge consists of three spans, the river span being a three-hinged arch of 522½-ft. span. The roadway is 27½ ft. wide, with footwalks on each side. In addition to the three main spans of the bridge there is a south approach consisting of a steel viaduct 368 ft. long which, together with the approaches on the other side, makes the total length of the bridge 2,250 ft. The total cost was $450,000, and the bridge was built by the Schultze Bridge Co.

Portland, Me.—Commissioner of Public Works Fernald opened the bids for the new steel highway bridge at this place on March 16. There were seven bids ranging from $4,389 to $5,475. The Boston Bridge Works made the former bid and the contract was awarded to them. The new bridge is to be of steel 141 ft. long with a roadway width of 18 ft. The abutments will be of granite.

Renfrew, Ont.—It is reported that an iron bridge will be built across the Bonnechere River, between Bonnechere Point and Renfew.

Rochester, N. Y.—It is reported that a foot bridge, 400 ft. long, will be built in Glenwood Park, its estimated cost being about $1,300.

Somerville, N. J.—The Berlin Iron Bridge Co, of East Berlin, Conn, has secured the contract for the bridge over the south branch of the Raritan river, their bid being $6,800. The bridge will be in two spans of 142 ft. 6 in. each, of the usual parabolic type built by this company. T. H. Hendershot secured the contract for the substructure, at $6.64 per cubic yard.

Steelton, Pa.—A bridge will be constructed over the canal at this place by the Commissioners of Dauphin County, Pa.

Taunton, Mass.—Plans and specifications are being prepared for the proposed bridge at Washington street, and it is reported that bids will be asked for soon.

Thamesford, Ont.—The C. P. R. will rebuild the bridge over the Thames River at this place.

Troy, N. Y.—Plans have been made for a 75 ft. span bridge at Campbell avenue, over the Wyantskill River. The bridge will cost about $4,000.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Chicago, Rock Island & Pacific, quarterly, ½ per cent., payable May 1.

New York Central & Hudson River, 1 per cent., payable April 15.

Norfolk & Southern, quarterly, 1 per cent., payable April 10.

Stockholders' Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Canadian Pacific, annual, company's office, Montreal, Canada, April 1.

Chicago & Alton, annual, company's office, Chicago, April 6.

Chicago & North Michigan, annual, company's office, Traverse City, Mich., April 15.

Chicago & West Michigan, annual, company's office, Grand Rapids, Mich., April 15.

Cleveland, Lorain & Wheeling, special, company's office, Hickox Building, Cleveland, O., April 10.

Joliet & Chicago, annual, company's office, Chicago, April 6.

New York Central & Hudson River, annual, company's office, Union Station, Albany, N. Y., April 15.

Panama, annual, company's office, 29 Broadway, N. Y., April 6.

Pittsburgh, Cincinnati, Chicago & St. Louis, annual, Penn avenue and Tenth street, Pittsburgh, Pa., April 14.

Technical Meetings.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *American Railway Association* will hold its spring meeting at the Burnett House, Cincinnati, O., April 15.

Association of Railroad Air Brake Men.

The third annual convention of this association will begin on Tuesday morning, April 4, at 9 a. m., in Boston, the headquarters being at the American House. The Committee of Arrangements has secured a rate of $1 a day for single rooms. F. M. Nellis is Chairman of the Committee of Arrangements. P. M. Kilroy, of Pine Bluff, Ark., is Secretary of the association.

National Transportation Association.

The National Transportation Association, composed of Boards of Trade, held its annual meeting at Chicago, March 19. The officers elected were: President, Frank Barry, Milwaukee; Vice-President, E. L. Rogers, Philadelphia; Secretary, George F. Stone, Chicago. The chief subject discussed was uniform classification of freight. Other subjects were collection of claims and efficient car service.

The New England Railroad Club.

At the February meeting of the New England Railroad Club the subject for the evening was the substitution of electricity for steam as a motive power in the operation of railroads. Mr. James F. McElroy opened the proceedings with a long paper developing the theory of the electric motor. This was followed by a paper by Dr. Louis F. Duncan which was read, in Dr. Duncan's absence by Mr. L. H. Parker, Electrical Engineer, who has been in charge for the General Electric Company of the installation of the Baltimore & Ohio work. This paper was a description of the electric plant and of the locomotives used in the Baltimore & Ohio tunnel with some account of the results obtained. This was followed by an address from Mr. Calvert Townley, of the Westinghouse Electric Co., who, after some general discussion of the principles involved, gave a short account of the Mt. Holly experiment of the Pennsylvania Railroad. There was a little discussion of the various papers.

Western Railway Club.

The regular March meeting of the Western Railway Club took place at the Auditorium Hotel, Chicago, on Tuesday, March 17.

The committee which was appointed at the last meeting to report on the standard loading of lumber and timber covering some suggestions made by Mr. Pulaski Leeds, Superintendent of Motive Power of the Louisville & Nashville Railroad, had not had an opportunity to meet during the month, and was continued. A report was heard from the committee on the recommendations of the club regarding the revision of the interchange rules.

A communication was read from Mr. W. C. Berg, of the Lehigh Valley railroad, in which it was urged that the club take action with other railroad clubs regarding an appeal to Congress for the necessary appropriation to complete the work in testing timbers which has been carried on by the Division of Forestry of the United States Department of Agriculture. Resolutions were passed urging the support of this measure.

There were discussions on Mr. J. N. Barr's paper "The Ninety and Nine," and on the paper of Mr. G. L. Patter on "Piece Work in Car Shops." The meeting closed with a topical discussion on swing motion and rigid trucks.

Engineers' Club of Philadelphia.

A regular meeting of the Club was held on Saturday, March 21, and a paper by Mr. Thomas Janvier on the Suburban Sewerage Question and the Description of Sewage Disposal Works at Wayne, was read. This paper was to have been read at the meeting of March 7, but owing to the illness of Mr. Janvier it was postponed. This paper was illustrated by lantern slides. In addition an exhibition of lantern slides was given, by William Easby, Jr., illustrating various methods of sewage disposal.

At the meeting of March 7, President A. Falkenau presided and 81 members and visitors were present. After the announcement of Mr. Janvier's illness Mr. John Birkinbine consented to present a communication in his stead.

Dr. Henry Leffman presented a description of the construction work on the Croton Aqueduct, New York, and also of ancient methods of plumbing, illustrated by a collection of lantern slides. Those illustrating the Croton Aqueduct were reproduced from the illustrations in the volume recently issued by the Aqueduct Commission of New York City. Dr. Leffman concluded with some remarks on the high death rate of Philadelphia, and the excessive number of cases of typhoid fever. The discussion was largely taken up with the proposed experiments to be made, to determine the desirability of filtering part of the Philadelphia water supply. Messrs. Trautwine, Birkinbine, Leffman, Price, Marburg, Landis, Hering and Morris took part in the discussion and the sentiment of the meeting was in favor of such experiments.

Mr. John Birkinbine presented some notes on "Water Renaissance."

New York Railroad Club.

The meeting of the New York Railroad Club on Thursday of last week took the form of a memorial meeting by reason of the death of the late Secretary of the Club, Mr. W. G. Wattson. The sincere regard in which Mr. Wattson was held by the members of the Club, toward whose success he had done much faithful work as a member of its Executive Committee for several years past, and as Secretary since last January, was evidenced as much by the large attendance—probably larger than at any previous meeting of the Club—as by the heartfelt words spoken at the meeting. There were many addresses, the speakers including Mr. Wattson's superior officer, Mr. C. W. Bradley, General Superintendent of the West Shore; Mr. George W. West, President of the Club; Mr. A. E. Mitchell, Mr. H. H. Vreeland, Mr. C. M. Meadenhall, Mr. R. A. Parke, Mr. W. W. Wheatly, Mr. Aldcorn, formerly Master Mechanic of the West Shore, and a number of others. We shall not attempt to report at any length what these speakers said. The addresses will undoubtedly be published in the Proceedings of the club, and they should be read there rather than in any abstract. Mr. Bradley spoke briefly and with much feeling. He said that to attempt to say all that he knew and felt about Mr. Wattson would detain the meeting until morning. He said that the week following the day in which Mr. Wattson was shot in his office at Weehawken was the saddest in his life. He had known Mr. Wattson intimately for 13 years, and had found him always a loyal, able and faithful officer.

Mr. W. W. Wheatly, Car Accountant of the West Shore, has been elected Secretary of the Club.

Engineers' Club of St. Louis.

The Club was called to order March 18, President Ockerson, 24 members and 2 visitors present. Mr. Arthur Winslow read a paper on the "Testing of Coals," being a consideration of the methods and objects involved in determining the properties and relative values of different coals for all uses, with special references to a series of investigations now in progress by the author. He classified the most important uses of coal as follows: First, steam making; second, cooking; third, domestic fires; fourth, gas making; fifth, forge and blacksmith work. Mr. Winslow's plans contemplate the investigation of all the standard coals of this country, with a view of determining their relative values for the above uses. The methods he proposes to adopt are as follows: First, inspection at the mines; second, collection of samples; third, proximate analyses; fourth, calorific determinations; fifth, laboratory tests; sixth, study of the coal in actual service. Work in the field has already begun, and the investigation will probably extend over a number of years.

Discussion followed by Messrs. Moore, Meier, Kinealy, Leighton, Bryan, Flad and Russell. The value of calorimeter tests was discussed, as well as the various methods of making such tests.

President Ockerson gave the results of some capacity tests on the United States dredging boat Beta, now operating near Memphis.

Col. Meier explained a bill now before Congress looking to improving the standing of naval engineers, and asked the members present to join him in signing a petition to St. Louis Congressmen, commending the subject to their favorable consideration.

PERSONAL.

—Mr. J. P. Gay has been appointed General Manager of the Michigan and Milwaukee fast freight line.

—Gen. George H. Nettleton, President of the Kansas City, Fort Scott & Memphis Railroad, is critically ill at his home in Kansas City, and it is thought he cannot recover.

—Mr. F. S. Higbid, Roadmaster of the Eastern Division of the Erie road, has been promoted to be Assistant to Chief Engineer C. W. Buchholz, of the Erie, with office in New York.

—General Manager S. M. Prevost, of the Pennsylvania Railroad, has gone to Europe. He expects to be absent until the end of May, and is taking the trip for the benefit of his health.

—Mr. J. Brignell, formerly Superintendent of the Western Counties road in Nova Scotia, is now General Manager of the Nova Scotia Central road, with headquarters at Bridgewater, N. S.

—Mr. Charles Collins has resigned as Traffic Manager of the Hutchinson & Southern road in Kansas, and the duties of that office have been assumed by the General Manager, Mr. C. B. Hart.

—Mr. J. T. Crutchfield, recently Traveling Freight Agent of the Louisville & Nashville, with headquarters in New York City, has been promoted to be Eastern Freight Agent, with office at New York.

—Mr. Stuyvesant Fish, President of the Illinois Central Railroad, is announced to address the South and West Trade Congress in Charleston, S. C., April 29, on "Ways and Means to Facilitate Business Between the West and South."

—Mr. George C. Jones, recently a train dispatcher of the Wabash, is now in the office of the General Superintendent of the Grand Trunk at Montreal. Preparations are being made to introduce the Standard Code of Train Rules on the Grand Trunk.

—Mr. G. F. Huggins, for some time General Superintendent of the Choctaw, Oklahoma & Gulf, has resigned that office and the position will be abolished, the new General Manager of the road, Mr. Henry Wood, taking over the duties of the position.

—Mr. Harry B. Stewart has been appointed General Passenger Agent of the Cleveland, Canton & Southern, succeeding Mr. F. R. Briggs, resigned. Since 1890 he has been Ticket Agent of the company at Canton, having been previously with the Missouri Pacific as Traveling Auditor.

—Mr. Edward F. Leonard, President of the Toledo, Peoria & Western, and Secretary of the St. Louis, Alton & Terre Haute, has been chosen as one of the arbitrators of the Joint Traffic Association, Hon. Jacob D. Cox having declined to act. Mr. Leonard is one of the best known railroad men in the West, having been connected with the last named road since 1869.

—Mr. Orrin W. Clough, formerly Division Roadmaster of the New York Central, died at Syracuse, N. Y., on March 16. He was retired on a pension about a year and a half ago, having then been in railroad service nearly 40 years. He went to the New York Central in 1867 as Division Roadmaster and served in that office on various divisions until his retirement.

—Mr. Randolph Clark, Assistant Engineer of the Grand Trunk at Stratford, Ont., and an old employee of the Grand Trunk, has resigned and the office has been abolished. Mr. Clark was appointed Assistant Engineer about three years ago, having charge of the lines west of Port Hope, the lines east of that point being under the jurisdiction of an Assistant Engineer of Montreal.

—Mr. C. J. Haigh, Manager of the Commercial Express Fast Freight Line, which operates over the Grand Trunk and Erie roads, has been appointed General Freight Agent of the Grand Trunk. He has been in the service of that company for many years, beginning as a clerk at Portland, Me., in 1869. After various promotions and transfers in the traffic department of the company he became Manager of the Commercial Express in 1893.

—Mr. George B. Hazlehurst, General Superintendent of Motive Power of the Baltimore & Ohio Railroad, has resigned that position. Mr. Hazlehurst has held this position since 1891. He entered the Baltimore & Ohio service as a boy, and served first as a clerk and then with the surveying parties, becoming assistant surveyor. He was then transferred to the bridge department and remained there until made Superintendent of Motive Power six years ago.

—Mr. Daniel McLaren, General Superintendent of the Montana Central Division of the Great Northern, has resigned that office. He was appointed in August, 1894, when the Montana Central was made a division of the Great Northern lines. Although controlled by the Great Northern, it had been previously operated as a separate company. He had formerly been for many years General Superintendent of the Mobile & Ohio, having resigned from that company's service in March of the same year.

—Mr. E. L. Corthell informs us that he has formed an association with Mr. Dankmar Adler, the well-known architect, who designed the Auditorium and other large

buildings. This association is for the purpose of combining their engineering and architectural skill and experience in the design and execution of large structures and works. They propose to design and construct power plants and power transmissions, manufacturing establishments, railroad stations and shops, terminal facilities of railroads and harbors, and large structures of any kind.

—Major John C. Winder, late First Vice-President and General Manager of the Seaboard Air Line, died at his home at Raleigh, N. C., on Sunday last, March 22, aged 64 years. Major Winder had been living at Raleigh since his retirement from railroad service in November, 1894. He had been connected with the Raleigh & Augusta and other roads comprising the Seaboard Air Line for nearly 25 years. In his early life he had served in the engineering departments of various eastern railroad companies and for about four years, up to 1860, he was the Principal Assistant Engineer of the Croton Aqueduct at New York City. He served in the Confederate Army, and in 1866 he again took up railroad service, and in 1882 became General Manager of the Raleigh & Augusta, the Raleigh & Gaston, and the Carolina Central, which were combined as the Seaboard Air Line in 1890.

—Mr. James H. Stewart, one of the projectors of the Sandusky & Columbus Short Line, died at Sandusky, O., last week. Mr. Stewart was formerly a well-known railroad superintendent and had been connected with railroad business for nearly 40 years. About 1860 he was Division Superintendent on the Baltimore & Ohio lines in Ohio. Afterward he was engaged in railroad construction in Wisconsin and later on became General Manager of the Baltimore & Ohio Southwestern. In recent years he was President of the Lake Erie Construction Co., which built the Sandusky & Columbus Short Line. He was a director of that railroad until last fall. In July, 1895, he was appointed Receiver of the Columbus, Sandusky & Hocking, which had been formed by the consolidation of the Sandusky & Columbus Short Line and the Columbus, Shawnee & Hocking.

—Mr. William H. Underwood has been made General Eastern Passenger Agent of the Michigan Central, and Lewis D. Huesner has been made General Western Passenger Agent of the same company, at Chicago, under a recent rearrangement of the jurisdiction of the various division passenger agents. Mr. Underwood's title has heretofore been Eastern Passenger Agent, and his headquarters remain as before, at Buffalo. He has general direction of the passenger business of the company in New England and the Middle States. Mr. Huesner will have general direction of the passenger business in Chicago and in the territory west to the Rocky Mountains. He has been for some years City Ticket Agent of the Michigan Central at Chicago, being appointed to that office in 1884. Before that date he was with the New York Central, in its ticket offices at Rochester and Suspension Bridge.

—Mr. Harvey Middleton, recently with the Pullman Palace Car Co., has just been appointed General Superintendent of Motive Power of the Baltimore & Ohio Railroad. Before going to the Pullman Company in 1891 as Superintendent of Construction Mr. Middleton had held positions similar to that which he has now accepted on the Baltimore & Ohio, and we suppose it is safe to say that he has been at the head of the mechanical departments of more of the important roads of this country than any other living railroad officer. He had served in the mechanical department of the Philadelphia & Reading and the Manitoba road before becoming Superintendent of Machinery on the Louisville & Nashville in 1884. Five years later he was appointed to a similar office on the Atchison, Topeka & Santa Fe and not long after that became Superintendent of Motive Power and Machinery of the Union Pacific, a position which he held until he went to the Pullman Car Company.

—Mr. L. G. Johnson, District Superintendent of the Wagner Palace Car Co., at the Michigan Central station at Chicago, has been transferred to the Lake Shore station of the same city and his promotion has been followed by a number of transfers of superintendents of the Wagner Company. Mr. F. D. Chamberlain, District Superintendent at Detroit, goes to Chicago as Division Superintendent for the Michigan Central. Mr. Charles C. Cox, who has been Assistant District Superintendent has been transferred to Detroit as Mr. Chamberlain's successor. His own successor at Buffalo is Mr. Edward G. Kirk, who has been night agent at that city. Mr. M. C. Carey, formerly Agent at Montreal, has been made a District Superintendent at the same city. Mr. Cox, who is now promoted to an important district superintendency, has been with the Wagner Company about nine years. He was for five years Ticket Agent at the Exchange Street Station, at Buffalo. He then became Wagner conductor on the Empire State express and in 1892 was promoted to be Assistant Superintendent.

—Mr. William A. Allen, Chief Engineer of the Maine Central Railroad, was killed at Lewiston, Me., March 21. The press dispatches give the following account of his death: He was on his way to Lewiston to inspect the work of building a sidewalk in the lower chords of the Maine Central Railroad bridge over Lewiston Falls, and as the train from Portland was passing into the bridge he went out on the rear platform. He was on the north side of the platform and at the second pier from the Auburn end, when his head struck a bridge post. Workmen saw him tumble farward, lose his hold upon the railing and fall clear of the bridge.

The bridge at this place is 50 ft. above the upper fall of the dam, and Mr. Allen fell at the foot of the upper dam, where the water was at freshet height. He was not dead at the time, for workmen saw him struggle. Then he was carried down by the rapids and floated in the whirlpool toward the principal fall, known as West Pitch. The distance is from 300 to 500 ft., and he was swept on the jagged rocks. Here his hand and arm were seen protruding, and then he took the final plunge and was seen no more.

Mr. Allen was born at Bath, Me., in 1852. He was a son of the Rev. Charles F. Allen, of the Maine Methodist Conference, a graduate of the Maine State College, and had been in the employ of the Maine Central for almost 20 years. He was elected a member American Society of Civil Engineers in May. Those who knew Mr. Allen well thought highly of him. He was a good railroad engineer, a conscientious, high-minded man, of thoroughly sound character, both professional and personal, and he was also a courteous and modest gentleman. The tragedy of his death is especially sad, as coming to one so young, so active and so useful.

ELECTIONS AND APPOINTMENTS.

Alabama Great Southern.—J. W. Morrow has been appointed Auditor of Disbursements, with office at Washington, D. C. All labor and material reports, pay polls, vouchers, bills and correspondence relating thereto are to be addressed to him, instead of to the Assistant Auditor as heretofore.

Baltimore, Chesapeake & Western.—The incorporators of this company just incorporated in. Many land are: George E. Boynton, President; Frank C. Drane, of Baltimore, First Vice-President and General Manager; W. J. Gascoyne, Second Vice-President; W. R. D. Gascoyne, Secretary; John Q. A. Sand, Treasurer.

Cleveland, Akron & Columbus.—At the annual meeting the company, at Cleveland, O., on March 19, the following directors were elected: Calvin S. Brice, Samuel Thomas, Andrew Squire, E. R. Thomas, Stewart M. Brice, C. N. Haskell and A. L. Conger. The directors will meet in New York to elect officers.

Los Angeles Terminal.—Owing to the serious illness of T. B. Burnett, Vice-President and General Manager of this company, the following officers have been elected and appointed to their respective offices: T. E. Gibbon, Vice-President; Wm. Wineup, Acting General Manager, in charge of traffic and operation, and F. K. Rule, Treasurer and Auditor.

Pennsylvania.—At the annual election for directors of the company on March 24, the result was the re-election of the present Board, viz.: George B. Roberts, A. J. Cassatt, Alexander M. Fox, Clement A. Griscom, Alexander Biddle, Benjamin B. Comegys, N. Barker Shortridge, Amos R. Little, Henry D. Welsh, William H. Barnes, William L. Elkins, George Wood and C. Stuart Patterson.

Pennsylvania Midland.—The following directors were elected at a meeting at Harrisburg, Pa., last week: President, D. P. Gerberich, of Lebanon; Vice-President, John H. Bressler, Lebanon; Treasurer, Landis A. Geberich, Lebanon; Secretary Lewis Seyster, Hagerstown, Md.; Directors, James March, Sr., Lebanon; James March, Jr., Hagerstown, Md.; John H. Bressler, Lebanon; William Bollman, Lebanon; Daniel Callahan, Washington, and James T. Harbin, Hagerstown, Md.

Philadelphia & Brigantine Beach.—The officers of this reorganized company are: George H. Cook, of New York City, President; James B. Van Woertz, Treasurer, and R. D. A. Parrott, General Manager, of Philadelphia.

Puget Sound, Mount Tacoma & Eastern.—The incorporators are George L. Holmes, Phillip V. Cæsar, Lucius R. Manning, Isaac W. Anderson, Truman W. Enos and William C. Wheeler, of Tacoma, Wash. The company has just been organized.

Wabash.—George M. Burns has been hereby appointed Fuel Agent of this company. He will have charge of the purchasing, distribution, inspection and testing of all fuel for locomotives, reporting to the Vice-President and General Manager.

RAILROAD CONSTRUCTION, Incorporations, Surveys, Etc.

Aransas Harbor & Northern.—The engineers have about completed the preliminary survey to Smithville, Tex., the proposed northern terminus, where a connection will be made with the Missouri, Kansas & Texas. Last week the surveys were working beyond Gonzales, about 20 miles south of Smithville. Two routes have been surveyed, and as soon as it is decided which line to adopt, construction work will probably be commenced. The line will be 156 miles long, from Aransas Pass, on the coast, to Smithville. The road is projected by the company which is developing the deep water harbor on Aransas Bay. C. H. Sawyer is Vice-President and General Manager, and W. D. Jenkins, of Aransas Pass, Tex., is Chief Engineer.

Augusta Belt.—The project for a belt line at Augusta, Ga., which has been discussed for some time, has resulted in the organization of a railroad under this name to build the road, which will be about three miles long. Charles Estes, C. V. Walker and others of Augusta, Ga., are the incorporators. The Georgia Railroad and other lines entering Augusta will be interested in the construction of the line.

Barberton Belt Line.—A charter for this railroad company was filed at Barberton, O., last week. The company is building a branch line a few miles in length as part of the development work of the Barberton Land Company. The actual work of construction has been under way for some time.

Boston & Maine.—About seven miles of the Central Massachusetts Division between West Berlin and Oakdale, Mass., which is a station north of Worcester, is to be re-located. Several surveys have been made, but it is not understood that a definite location has been decided upon. The line will be through a hilly country and rather costly to build. The reconstruction of this part of the road is made necessary by the construction of a new reservoir by the Metropolitan Water Board of Boston.

Carolina Central.—This road will be extended a distance of several miles, on the Ellenboro branch, to Henrietta, N. C., so as to reach a new town around the new cotton mill just completed.

Cherryvale & Oklahoma Southern.—J. H. Bartles, of Kansas City, Kan., a promoter of the road, reports that construction work has been begun on the first section of the road, which is to be built from Bartlesville to Osage City, Okla., a distance of 90 miles.

Chicago & Northwestern.—The company has let to D. M. Streeter, of Chicago, the contract to build 57 miles of road, extending from Gillett, Oconto County, to a point in Forest County a few miles south of Cavour, Wis., a station on the "Soo" road. Work is to be begun immediately and completed by Nov. 1. The line may be ultimately extended to Iron River, Mich. The extension lies exclusively in Oconto and Forest Counties. It is surveyed through an extensive and valuable tract of hardwood timber.

Choctaw, Oklahoma & Gulf.—The company proposes to build a branch line of about 12 miles from Wister Junction, the Eastern terminus of its road, north to a connection with the Kansas City, Pittsburgh & Gulf now building into Texas. The cost of the extension is estimated at about $167,000. The funds for the work are to be provided for by an issue of new preferred stock as described in another column.

Detroit & Mackinac.—Surveys are now practically completed for the extension of 34 miles from Omer southwest to Bay City, Mich., but the company has not decided which one of two or three lines will be used. Probably some line running between the Michigan Central and Saginaw Bay will be adopted. Contracts for the grading will be let about April 15. The work is very light. The maximum grade will not exceed 10 ft. to the mile, and the maximum curve, two degrees. The bridges will all be of stone and iron. There will be no large bridges except the one at Bay City over the Saginaw River. The total length of this bridge will be 692 ft., including two draw spans of 96 ft. in the clear. The water is about 32 ft. deep in the deepest part of the Saginaw River where the line will cross, with about 30 ft. of mud below that. Bonds were sold last fall providing sufficient money for the construction of this extension. The company's standard 70-lb. rail with 6 hole angle splices will be used. J. D. Hawks is Vice-President and General Manager, with office at Detroit, Mich.

Flint & Pere Marquette.—The company has begun active work on the Toledo extension, and the engineering parties are making the final surveys. The graders will begin work as soon as the frost is out of the ground, and it is hoped to complete the line in time to run trains into Toledo this fall. The company will use the Ann Arbor station and terminals in Toledo. It will build from Monroe to the Ohio State line, where it will connect with the Ann Arbor road.

Florida East Coast.—The tracklaying on the extension of this line to Biscayne Bay is now going on very rapidly, and over half a mile of track is being laid daily. The tracklaying forces are now close to Miami, Fla., which will be the southern terminus of the railroad. The entire line to that point will probably be turned over to the contractors early next month. Trains have been running for the last month to Fort Lauderdale at New River, about 40 miles south of Palm Beach, which is the location of Mr. Flagler's new hotel, the Royal Poinciana.

Georgia & Alabama.—General Manager Gabbett announces that this company will begin operating the branch of the Savannah & Western between Lyons and Meldrum, Ga., on March 31. A trackage agreement has been made with the Central of Georgia for the use of its line from Meldrum into Savannah, and that company's terminals and those of the Ocean Steamship Co. at Savannah will also be used under the agreement. The present terminus of this company's road is now at Lyons, Ga., and, as has been explained in these columns recently, the Georgia & Alabama has recently concluded a perpetual lease of the Savannah & Western line between Lyons and Meldrum, 70 miles.

Georgia, Carolina & Northern.—This company will build a branch line to a new cotton mill settlement near Abbeville, S. C., and Superintendent Berkley will this week have his engineers at Abbeville to begin a survey of the route.

Georgia Northern.—The survey for the northern extension of this road beyond Moultrie, Ga., referred to in our first issue in January of this year, will be completed within a short time to Albany, Ga. The construction material is now arriving at the present terminus and the grading will begin as soon as the survey is finished.

International Pacific.—A charter for this railroad company has been filed with the Secretary of State in Topeka, Kan. The object of the corporation is to construct a road from Guaymas, on the west coast of Mexico, to Deming, N. M., where it will connect with the Atchison, Topeka & Santa Fe. The incorporators are Hugh T. Richards, of Los Angeles; Frederick Bartlett, Walter G. Seaver, Charles N. Hale and George E. Woodhouse, of Chicago, and David D. Hoag, Frederick E. Buchanan and Winfield Freeman, of Kansas City, Kan.

Kansas City & Northern Connecting.—Chief Engineer Marvin, with a large party of engineers, is surveying several lines for this company through Clay County, Mo., north of the Missouri River. It is stated that he has made a survey for a line about 70 miles long from Trenton, in north Missouri, to Plattsburgh and Liberty, Mo. The surveys are now being made principally to locate the line from Liberty into Kansas City. As stated recently, the new railroad is one of the corporations controlled by the Kansas City, Pittsburgh & Gulf.

Mexican International.—The contract has been let for an extension of the railroad from Matamoros, 15 miles north of Torreon, Mex., the present southern terminus of the road, to Tlahualilo, a large hacienda. The extension will be about 65 miles long, and will traverse the rich irrigated lands of the Laguna district. The contractor, W. T. Robertson, will begin work immediately.

Mexico, Cuernavaca & Pacific.—At a special stockholders' meeting held in Denver, Col., the capital stock of the company was raised from $2,000,000 to $6,000,000, and at a directors' meeting held later a contract for the construction of the line from Cuernavaca to Acapulco, was let to the Mexico & Acapulco Construction Co., which is also a Colorado corporation. The construction company has already arranged to let sub-contracts for the grading, and locating parties are at several points to push work as rapidly as can be reasonably done. R. E. Briggs, formerly Chief Engineer for the company, having resigned, the position is at present filled by J. H. Kain, Acting Chief Engineer. The section of the line between Puente de Ixtla and the Rio Mexcala, a distance of 70 miles, will be finished first, two years being required to fully complete that section. The road is one of the most important railroad enterprises in Mexico. While the eastern portion of the country is now quite well supplied with transportation facilities between the most important cities and states of Mexico, the western portion, save for the Sonora branch of the Atchison, has been ignored. The result of this has been that while the eastern portion of the republic has made remarkable advances in growth and development of its abundant resources, the western states have made little progress. It was to open up the western part of the country that this line was originally proposed. Besides the development of agricultural and mineral country, the road will have at Acapulco a fine deep-water harbor. The distance from Mexico City to Acapulco by this road will be about 300 miles, and the maximum grade for a short distance on the western slope of the main range will be 3 per cent. The constructed line now about 50 miles in length has a maximum grade of 2½ per cent. It rises by easy curvatures from the City of Mexico up the main range, reaching an elevation at La Cima of 9,892 ft., which is the highest point on the entire route. From Tres Marias, the present terminus, the grade has already been constructed for a distance of six miles through the roughest rock work along the entire line down the Pacific slope of the main range, and there the maximum grade is 3 per cent. and the maximum curvature 6 degrees. There are two other lesser ranges to be crossed. The Mexican Government concession includes a subsidy of about $38,000 in bonds per mile. With this aid the company sees its way to complete the road to the Pacific Coast.

New Roads.—Judge Kerr and other citizens of the town of Sour Lake in Eastern Texas have been appointed a committee by the townspeople to promote the building of a branch line to the Southern Pacific at Sour Lake station. The line will be about 9 miles long, and it is stated that the officers of the Southern Pacific have

agreed to put down the rails if the roadbed is graded. A large subsidy in lands will be given to the company building the road.

North Carolina Roads.—A narrow-gage road, six miles in length, is being built from Thermal City, Rutherford County, to Panther Gap, and will be extended to Montford's Cove.

Ohio River & Charleston.—This road has decided to build a proposed extension via Miekler's, S. C., and the grading has been completed to Newberry, S. C.

Pennsylvania.—The Rosslyn or Georgetown branch, which the company has been constructing for some time past, is about completed, and will be ready for operation this week. This road was constructed as a freight line to accommodate the business in and around Washington. It commences at the south end of the Long Bridge at Washington, and runs to Georgetown, on the Virginia side of the Potomac River. At Georgetown it connects with the Washington Southern. The new line is about three miles long.

Quincy Quarry.—The Massachusetts Railroad Commissioners will give a hearing this week on the petition of the company for the approval of the location of the railroad which it proposes to build in Quincy, Mass., from the quarries to the Quincy Adams station of the New York, New Haven & Hartford.

St. Louis, Perry & Chicago.—Col. James M. Piper, of St. Louis, President of the road, tells the newspapers that he has succeeded in raising funds to insure the construction of this road and has secured a loan of $1,500,000 from the American Trust Bank of Boston.

South Jersey.—Edmunds & Miller, of Philadelphia, have been awarded the contract for grading the new branch road from Petersburgh, N. J., on this line east to Ocean City on the Atlantic Coast. The line, as already stated, will be about 10 miles long, and it is to be ready for operation by May 15. When complete it will be turned over to the South Jersey for operation by that company. C. Emery Day, of Philadelphia, and Fowler & Loomis, of 436 Walnut street, Philadelphia, have charge of the construction of the road.

Southwestern.—The construction work on this road, which is to form part of the new Montreal line of the St. Lawrence & Adirondack, is now about half completed. The road will be 13 miles long, extending between Beauharnois and Caughnawaga, Que. The contractors are Cameron & Fitzpatrick. The tracklaying has just begun. The Chateaugay River will be crossed by a steel bridge with four spans of 150 ft. each.

Wellston & Ironton.—A company of this name was incorporated in Ohio last week to build a road from Wellston through the Jackson County mining district in Southern Ohio to the Ohio River at a point near Perry Township. H. T. Chittenden, H. L. Chapman and others of Columbus, O., are the incorporators.

Electric Railroad Construction.

Ballston, N. Y.—The Ballston Terminal Railroad Co. has received a franchise for a street railroad for which it applied in January. The road will be about 10 miles long from Ballston to Middle Grove. The capital stock is $300,000.

Baltimore, Md.—The Baltimore & Ohio will extend the electric equipment at the Belt line tunnel about 3,500 ft. This will enable the electric motors to help draw the trains over the grade and curve above North avenue, where at present an additional locomotive is required.

Brookland, S. C.—A company has been organized to build an electric railroad through Brookland to Horseshoe Lake.

Chicago.—The Love Electric Traction Co., which is to equip the General Electric Street Railway in Chicago with the underground trolley, expects to begin work in about 60 days. A part of the road will be in operation next winter, and the remainder will be completed in 18 months. There will be 22 miles of track, and the contract is for $3,000,000.

An ordinance has been introduced in the City Council granting the Metropolitan Traction Co. permission to build underground roads under streets and public grounds, and under the Chicago River. The company is to issue a bond for $250,000, and is to pay to the city three per cent. of the gross receipts. The city has the right to buy the system at the end of 50 years. Another ordinance has been introduced giving the Chicago City Railway Co. rights of way on a number of streets between Fifteenth and Fifty-first streets.

Clarksville, Tenn.—The Clarksville Electric Railway Co. has let the contract for the construction of seven miles of track to John Coleman, of Louisville.

Grimsby, Ont.—The Hamilton, Grimsby & Beamsville Railway directors have employed R. H. Fraser, of Toronto, to survey a private route from Grimsby to Grimsby Park, to avoid going along the public road, owing to the high terms asked for the privilege by the Grimsby Council.

Honesdale, Pa.—A franchise has been granted for an electric road from Seelyville, through Honesdale to White Mills. W. J. Rief, W. J. Ferber, and M. B. Allen are among those interested.

Jefferson City, Mo.—The Oregon & Forest City Electric Railway Co. has been incorporated with a capital stock of $60,000, by J. E. Cummins, F. C. Oakley, R. C. Benton and others.

Kansas City, Mo.—The Brooklyn Avenue Railway Co. has been incorporated with a capital stock of $200,000, by James Lillis, W. J. Johnson, J. H. Lucas and others.

McKeesport, Pa.—The Versailles Electric Railway Co. has made preliminary surveys for the extension of its road to Buena Vista and Industry, five miles further up the valley.

Meadville, Pa.—The Meadville Street Railway Co. has paid the city $4,000 for its franchise, as agreed a few weeks ago, and will soon begin construction.

Montreal, Que.—Surveys are being made for the new line of the Montreal Park & Island Railway, from Back River to St. Vincent de Paul.

Newark, N. J.—The Belmar, Spring Lake, Sea Girt & Manasquan Railway Co. has been organized by George F. Kissam, J. D. Lindsay, of New York; William B. Price, of Newark, and George B. Kirkbride, of Philadelphia, to build a road from Belmar to Bay Head, nine miles, passing through Sea Girt, Manasquan, Point Pleasant and other seaside towns. At Belmar it will connect with the Atlantic Coast line, running north through Ocean Grove and Long Branch. It is expected that the new road will be completed in July.

New York.—The Board of Aldermen has passed ordinances granting to the Metropolitan Railway Co. authority to build crosstown extensions from Broadway, through Broome street to Greene street, through Third and Fourth streets between Wooster street and Broadway, and through Cortlandt street from Broadway to West street. The Cortlandt street line will give a connection with the Pennsylvania Ferry.

Richmond, Va.—The Fairmount Traction Co. has been incorporated, with a capital stock of $100,000, by S. H. Pulliam, W. J. Westwood and others.

Rising Sun, Md.—The Rising Sun, North East & Elk River Electric Railroad has been incorporated by Andrew Anderson, J. T. Reed, L. O. Cameron and others of Cecil. The road will pass through the above places and the capital is $50,000.

Salem, Va.—The Salem-Blacksburg Electric Railway Co. has been incorporated with a capital stock of $300,000 by J. W. F. Allemong, J. C. Langhorne and others.

Salt Lake City, Utah.—The Salt Lake & Ogden Railway Co. has been organized and articles of incorporation filed. The company proposes to build and operate 40 miles of electric railroad between Salt Lake City and Ogden. A company is erecting a large power plant in Ogden canyon, and will probably furnish power for the road, which will first be built from the canyon to Ogden, a distance of four miles. The directors are C. K. Bannister, E. M. Allison, Jr., of Ogden; E. W. Duncan, J. S. Critchlow, and Cousten Browne, Jr., of Salt Lake City, and the capital is $800,000.

Thorold, Ont.—The Thorold Street Railway is to be changed to an electric road, and T rails will be substituted for those now used.

West Superior, Wis.—The Superior & Cloquet Electric Railway Co. has been organized, for the purpose of building an electric road to New Duluth, Minn. Power is to be obtained from the St. Louis River. The road will be used for bringing lumber and ore to the city, besides doing a regular passenger traffic. Michael S. Bright is President and C. E. Bushell Chief Engineer.

GENERAL RAILROAD NEWS.

Boston & Lowell.—The Massachusetts Railroad Commissioners last week heard the petition of the railroad for the approval of an issue of $750,000 four per cent. 50-year bonds. These bonds are to take up an issue coming due which draws interest at 6 per cent.

Cape Fear & Yadkin Valley.—The question of the conditions of the sale of this North Carolina road, soon to take place, came up before Judge Simonton, of the United States Circuit Court, at Asheville, N. C., last week. Decision was reserved. There are two opposing committees of reorganization, the Baltimore and New York Committees. The former committee represents a minority of the Series "A," Bonds, or that part of the road extending from Greensboro to Fayetteville, N. C., thence to Bennetsville, S. C., and a majority of the bonds known as Series "B" and "C," representing respectively those sections of the road running from Greensboro west to Mt. Airy, N. C., and from Fayetteville south to Wilmington, N. C. The New York Committee represents over two-thirds of the "A" bonds. The Baltimore Committee argued for the sale as a whole, in its entirety, only, while the New York Committee contended for the sale of the road, first, as a whole, and then that it be sold in the three sections represented by the bonds so as to determine the value of the different sections. These propositions were submitted to Judge Simonton, who now has them under consideration. The Southern Railway made an "upset" offer of $1,692,000 for the entire property, divided as follows: One million for that part of the road extending from Greensboro, N. C., to the South Carolina line and represented by the "A" bonds; $367,000 for that part running from Greensboro to Mt. Avey and represented by the "B" bonds, and $325,000 for that portion extending from Fayetteville, N. C., to Wilmington, N. C., and represented by the "C" bonds. It is the general impression that the Southern will secure the road, and that it will be ordered sold in July.

Carolina, Knoxville & Western.—Judge Simonton, in the United States Court at Charleston, S. C., last week, signed an order for the sale of this road at Greenville, S. C., on April 18. This road was offered for sale about a month ago, but there were no bids. It is said that a sale was prevented by a misunderstanding which has since been cleared up, and several bids at the forthcoming sale are said to be assured.

Cedar Falls & Minnesota.—At the request of the holders of more than 90 per cent of the bonds, Mr. Joseph Sampson, trustee, has filed in the County Court at Waverly, Ia., a bill for the foreclosure of the road, which is about 80 miles long and is leased to the Dubuque & Sioux City. That road is a leased line of the Illinois Central.

The validity of the lease was contested by the Dubuque & Sioux City, but in October, 1890, a decision was handed down confirming its validity. From this decision an appeal was taken to the Supreme Court, and the case is still pending.

Central Vermont.—Charles M. Hays and E. C. Smith were appointed Receivers for this road last week by the judges of the various United States Circuit Courts having jurisdiction. The suit for a Receiver is auxiliary to a suit brought by the Grand Trunk road. The Central Vermont road owns about 195 miles of road from Rouse's Point, at the northern end of Lake Champlain. It operates altogether about 700 miles across the states of New Hampshire and Massachusetts to New London Conn., on the Long Island shore.

The suit under which the receivers were appointed was an equity suit, brought by the Grand Trunk against the railroad on a claim for about $450,712, which the Grand Trunk alleges to be due it on traffic balances. The defendant company admits the validity of the lien under which the Grand Trunk asked for receivers, but asks that it be required to furnish proof as to the amounts due.

President Smith has issued a statement in regard to the receivership, in which he says that the application for the receivers was made without the knowledge of the Central Vermont, and was a complete surprise to its officers. The Grand Trunk, he says, is a large holder of the securities of the Central Vermont, and is also a large creditor. He says that the motive of the Grand Trunk in this application does not appear to be well defined, but from the fact that President Smith, of the Central Vermont, was made a joint receiver with Mr. Hays, of the Grand Trunk, at the request of the latter company.

Chesapeake & Ohio.—Earnings for January are reported as follows:

	1896.	1895.	1894.
Gross earn	$940,124	$781,104	$756,070
Oper. exp	668,513	530 977	567,698
Net earn	$271,611	$250,127	$248,972
Net 7 months	1,997,631	1,951,101	1,954,071

Choctaw, Oklahoma & Gulf.—It is proposed to issue 80,000 shares of five per cent. preferred stock to provide for the extinguishment of car trusts and the extension of lines. It is understood that a large portion of the stock has already been underwritten, and 75 per cent. of the general mortgage bonds have assented. The plan proposes to reduce the obligatory charges from $325,000 to $210,000. In payment for this stock the company will receive the following securities and cash: General mortgage bonds, $1,200,000; income mortgage bonds, $1,100,000; cash, $650,000; total, $2,950,000. By this arrangement the company will be enabled to retire $2,608,000 of existing obligations, build the important connection with the Kansas City, Pittsburgh & Gulf, and secure $192,000 in cash for present use, besides leaving $1,500,000 general mortgage bonds in its treasury for future capital requirements.

Cleveland, Canton & Southern.—The International Trust Co., of Boston, began suit at Cleveland, O., on March 21, for the foreclosure of the first mortgage bonds of the Cleveland & Canton, amounting to $2,000,000, on which interest has been defaulted. Other foreclosure proceedings under this mortgage had been previously begun by the same trust company. Foreclosure proceedings for the Cleveland, Canton & Southern property are now pending in three cases, one brought by the Knickerbocker Trust Co., of New York, the trustee of the consolidated mortgage bonds issued in 1892, another for the foreclosure of the Coshocton & Southern mortgage and the suit of the International Trust Co., referred to above. No definite action, however, has yet been taken for the reorganization of the road and no agreement has been effected between the various bondholders' committees. There are at least five of these committees.

Cleveland, Cincinnati, Chicago & St. Louis.—The earnings for January are reported as follows:

	1895.	1894	1893.
Gross earn	$1,102,260	$1,053,614	$940,.12
Oper exp	860,155	818,387	709,870
Net earn	$242,105	$235,227	$230,342
Net 7 months	2,199,416	2,010,852	2,002,853

Columbus, Hocking Valley & Toledo.—The annual report was not ready for publication at the stockholders' meeting, but the income statement shows the following results:

	1895.	1894.	1893.
Gross earn	$2,676,420	$2,688,698	$3,270,362
Oper. exp	1,566,765	1,538,896	1,808,735
Net earn	$1,109,655	$1,149,802	$1,461.6 7
P. c. exp. to gross earn	58½	53⅝	55⅜
Other income		10,000	10,000
Total	$1,109.655	$1,159,802	$1,471,627
Fixed charges	1,038,799	1,151,231	1,208,638
Surplus	$70,856	$8,571	$262,989

Included in charges are dividends of 5 per cent. on the preferred stock; in 1892 the dividend was only 2½ per cent., and the surplus for the year was $436,525.

Detroit, Lansing & Northern.—The Reorganization Committee announces that over 80 per cent. of the security holders of the preferred stock of this railroad and of the various divisonal mortgages effected by the reorganization plan have assented to the plan. They announce that securities will only be received by the committee until April 15 next.

Grand Trunk.—The company reports its January earnings as follows:

	1896.	1895.	1894.
Gross earn	$1,327,551	$1,259,169	$1,358,248
Oper. exp	1.086,103	1,049,375	1,175,356
Net earn	$241,748	$209,794	$182,892
Chicago & Grand Trunk:			
Gross earn	$267,979	$196,669	$238,326
Net earn	$15,568	(Def.) $10,852	(Def.) $9,797
Detroit, Grand Haven & Milwaukee:			
Gross earn	$76,644	$68,818	$71,758
Net earn	(def.) $676	$379	$754

Louisville, St. Louis & Texas.—The United States Circuit Court, at Louisville, has ordered this road sold to satisfy mortgages for $3,357,666, held by the Central Trust Company of New York. The road is in the hands of a receiver, Attilla Cox, who was appointed in August, 1893.

Marietta & North Georgia.—Judge Newman, of the United States Circuit Court, has agreed to the application made before him last week asking that the property be resold on the failure of the Atlantic, Georgia & Northern Construction Co., which bid in the property at foreclosure sale in November last, to complete the second payment. Judge Newman has ordered that the Georgia Division of the road be sold at Marietta April 25, and the Tennessee Division at Knoxville on April 23.

New Jersey & New York.—Negotiations for the purchase or lease of this road by the Erie Railroad Company are about completed. It is stated that the terms of the agreement have been approved by the officers of both companies, but the date for the actual transfer of the property has not yet been decided upon. One of the directors of the Erie states that the arrangement now proposed is for the lease of the road under terms which will look to the ultimate acquirement of the property by the Erie. The road operates about 48 miles of line in the northern part of New Jersey, extending across the New York State line to Garnerville. The main line is about 30 miles in length from a junction with the Erie road to Garnerville. From the latter point it leases a road to Haverstraw, N. Y., on the Hudson River. The present company was organized in 1880 as the successor of a property sold under foreclosure. It has been operated independently, but uses the terminus of the Erie road in Jersey City.

New York Central & Hudson River.—The earnings for three months and nine months are reported below (partly estimated in 1896):

	1896.	1895	1894.
Gross earn	$10,484.690	$9 835,813	$9,722,854
Oper. exp	7,155,660	6,815,976	6,256,393
Net earn	$3,329,000	$3,019,837	$3,466,461
P. c. exp. to gross earn	68¼	69⅜	64⅜
Charges	2,644,000	2,647,477	2,547,462
Surplus	$685,000	$372,360	$918,999
Dividends	1,000,000	954,283	1,174,707
Deficit	$315,000	$581,923	$255,708

Nine months:

	1896.	1895.	1894
Gross earn	$34,493,000	$31,994,868	$33,762,613
Net earn	$11,148,000	$10,685,175	$11 168,800
Charges	7,922,000	7,905,092	7,741,080
Dividend	3,000,000	3,339,990	3,410,408
Surplus	$226,300	Def. $559,907	Sur. $17,312

Norfolk & Western.—It is announced that the reorganization plan, as finally amended, was mailed to London this week, and that it will be issued there and in New York simultaneously on April 1.

Oregon Improvement Co.—Attorneys for the Farmers' Loan & Trust Co. began suit in the United States Circuit Court in California last week for the sale of the property.

Philadelphia & Brigantine.—This company has been organized to succeed the old Brigantine Beach Railroad, whose affairs have been before the courts almost constantly since it was organized a few years ago. George H. Cook, who is President of the old company, is also President of the new company. The other officers are given in another column. The property was purchased by him under foreclosure of its first mortgage early in 1895, but the company got into renewed financial difficulties through the speculations of an officer of a Philadelphia security company, which was connected with the management of the railroad. The road is about 14 miles long, and was built from a connection with the Philadelphia & Reading to Brigantine Beach, on the Atlantic coast. The company has a capital stock of $300,000.

Philadelphia & Reading.—The foreclosure suit of this company, which has been filed in the United States Circuit Court, will come up for trial at Philadelphia next month. The attorneys are now preparing the legal papers for the foreclosure of the property, and it is said that the most important points in the decree have been agreed to. The general belief is that there will be not much further delay in the foreclosure proceedings by the Reorganization Committee, but it may be several months before the property can be sold.

Pittsburgh, Cincinnati, Chicago & St. Louis.—The earnings for February were:

	1896.	1895.	1894.
Gross earn	$1,179,293	$1,084,172	$1,012,707
Oper. exp	955,114	880,822	854,173
Net earn	$224,179	$203,350	$158,534
Int., rent, etc	261,928	263,219	.....
Deficit	$37,749	$59,369	.....

Southwestern Arkansas & Indian Territory.—J. A. Woodson, of Little Rock, Ark., has recently been appointed Receiver of this property and of the Smithton Lumber Co., which operates it. He succeeds Mr. Charles F. Penzel, who was appointed Receiver by the state court a few weeks ago and who resigned. The appointment of Mr. Woodson as Receiver was made by the United States Court at Little Rock. The Smithton Lumber Co. owns about 20,000 acres of agricultural and timber lands, and the railroad company, which was organized to reach its lands, has a capital stock of $1,400,000, of which about $360,000 has been issued. The railroad now in operation is 34 miles in length from Hebron, Clark County, to Antoine, crossing the St. Louis, Iron Mountain & Southern at Smithton. The grading has been done for some miles on an extension west from Antoine to Murfreesborough.

Union Pacific.—The earnings for January are reported below:

	1896.	1895.	Inc. or Dec.	
UNION PACIFIC SYSTEM.				
Gross earn	$1,551,601	$1,501,122	I.	$50,479
Oper. exp. (excl. taxes)	1,131,332	1,117,603	I.	13,729
Net earn	$423,269	$386,518	I.	$36,750
OREGON SHORT LINE & UTAH NORTHERN.				
Gross earn	$386,700	$330,462	I.	$56,237
Oper. exp. (excl. taxes)	233,593	266,676	D.	32,683
Net earn	$152,706	$63,786	I.	$88,920
ST. JOSEPH & GRAND ISLAND				
Gross earn	$48,903	$48,247	I.	$655
Oper. exp. (excl. taxes)	40,920	36,703	I.	4,217
Net earn	$7,983	$11,544	D.	$3,561
CENTRAL BRANCH.				
Gross earn	$36,922	$21,373	I.	$15,588
Oper. exp. (incl. taxes)	19,044	17,516	I.	1,528
Surplus	$17,878	$3,817	I.	$14,060

Woonsocket & Pascoag.—The New England Railroad Company has bought all the stock of this company for $50 a share, or $100,000 for the whole, also assuming the $100,000 bonded debt. The entire interest charges on bonds and the sum borrowed for payment for stock will be $16,000 a year, or $5,000 a year less than has been paid for the lease hitherto. The road is 10 miles long, in the northeast section of Rhode Island.

Electric Railroad News.

Boston, Mass.—The Railroad Commissioners have approved the issue of $70,000 additional stock by the Lynn & Boston Street Railroad Co. The money is to be used for reconstructing the Wenham branch of the road and for other improvements in Essex County.

Buffalo, N. Y.—The Buffalo Traction Co. and the Buffalo Railway Co. have come to an agreement by which the Traction Co. will be able to build its lines. The Railway Co. gave the right of using its tracks to the new company, for which the latter is to pay a certain rent, and withdrew its opposition to the Traction Co., provided this company would not give up certain proposed lines. A system of free transfers has also been agreed upon.

Chicago.—The directors of the Chicago City Railway Co. have decided to issue $2,000,000 of bonds, authorized by the stockholders last January. The company proposes to issue $1,000,000 on July 1 and another $1,000,000 on Oct. 1. The bonds will be offered at par to the stockholders. The company spent $1,300,000 last year in extensions and equipment, and the increase bonds are to meet the expenses of further extensions this year. Most of the money will be spent in cross-town lines.

Houston, Tex.—The Houston City Street Railway will be sold at foreclosure on May 5. The minimum price for which it may be sold has been put at $100,000. The road has been for some time in the hands of a receiver.

Kalamazoo, Mich.—The electric street railroad of this city, which was built in 1894 at a cost of $250,000, has been sold by the General Electric Co. to a local syndicate for about half that amount.

New York.—The Thirty-fourth Street Railroad Co. and the Thirty-fourth Street Ferry & Eleventh Avenue Railroad Co. have filed articles of consolidation under the name of the Thirty-fourth Street Crosstown Railway Co. The capital stock of the new company is $1,000,000, and among the directors are E. R. Lynch, of Brooklyn; F. Viewig, of Avondale, N. J.; A. F. McCabe, of New York, and J. B. Ker, of Undercliff, N. J.

Trenton, N. J.—The bills requiring all electric roads in first class counties to charge not more than a five cent fare between points through which the road extends and to have all cars properly heated and ventilated were passed by the legislature. The bill requiring the electric railroad companies to light the streets through which their roads extend was rejected.

Winona, Minn.—The property of the Winona General Electric Co., the Winona City Railway Co., the Northwest General Co., and allied corporations will be sold at foreclosure on April 13.

TRAFFIC.

Traffic Notes.

The value of breadstuffs, chiefly corn, exported from Newport News in the month of February, was $1,351,900, about 2½ times more than during the same month of 1895. The total in January was still larger, and was about twice as large as in January, 1895.

The Sunset Limited express train between New Orleans and San Francisco will, for the remainder of the season—that is, until about the middle of April—run only once a week each way instead of twice a week as heretofore.

The South & West Grain Trade Congress will meet in Charleston, S. C., April 29. The Executive Committee announces that President Fish, of the Illinois Central, will deliver an address at the meeting.

The North Pacific Coast Local Passenger Association has been organized at Portland, Or. The Secretary is Mr. M. J. Roche.

The Railroad Commissioners of Iowa announce that they will give hearings, beginning March 31, on the question of adopting the Western classification, No. 22, for Iowa business.

The representatives of the interested lines met in New York March 20, and agreed upon rates for freight by lake and rail for the coming season as follows: Westbound—New York to Chicago, 50 cts. per 100 lbs., first class; New York to Duluth, 70 cts., and New York to St. Paul, 84 cts. Eastbound—St Paul to New York, 84 cts., first class, and 25 cts. for grain; Duluth to New York, 70 cts., first class, and 20 cts. for grain; Chicago to New York, 60 cts. first class, and 17½ for grain.

It seems that the Atlantic Coast line is not to have a monopoly of the fruit and vegetable traffic from the South this year. The South Carolina & Georgia, in connection with the Southern Railway, has made arrangements with the Pennsylvania to run fast through trains from Charleston and vicinity to New York and other Eastern points.

Southwestern Traffic Association.

A meeting was held in New York this week, at which several changes were made in the agreement of this association. The association is to have a Board of Control, and a penalty is to be imposed for violations of the contract (maximum $5,000).

Grain Rates to the Gulf of Mexico.

The decision of arbitrators Faithorn and Howe on a readjustment of the trans-Missouri grain rates has been given to Chairman Midgley, of the Western Freight Association, and by him communicated to the officers of the Western roads; and the latter are now in session in Chicago, arranging details for putting the rates in effect April 1. The decision covers 40 typewritten pages and is very complete. The arbitrators say in their report that throughout their work they have been careful to observe the long and short haul clause of the Interstate Commerce law. Briefly stated the decision advances grain rates from Kansas and Nebraska points to the Gulf ports from 4 to 7 cents per 100 lbs. North of the Southern boundary of the state of Kansas and east of a line drawn through Kansas just West of the Western terminal of the Missouri Pacific road, the rates to New Orleans and Galveston are to be equal. From all other points the rates to New Orleans are to be from 1 to 3 cents higher than to Galveston. The following adjustment will govern the rates on flaxseed, wheat and grain products: Wheat 4 cents per 100 lbs. higher than corn, and flaxseed 7 cents higher than corn. Grain products will take the flaxseed, wheat or corn rate, or differentials above or below the same, as provided in the Western classification. In some cases the rates to the Gulf ports are advanced and from other points lowered. While there was some dissatisfaction expressed over the new rates the roads have bound themselves to abide by the arbitrators' decision. It is believed that the readjusted rates will, in a measure, check the movement of grain to the Gulf, but many officers of Western roads leading into Chicago believe that the new channel for export traffic "has come to stay" as rates from the trans-Missouri territory cannot be made high enough to equal the all-rail rates to Atlantic ports. They very generally concede that hereafter during the cold season, when lake navigation is closed and corn does not suffer from heat in the South, export grain will continue to go to the Gulf ports, and with increased volume year by year.

Commission Decision on Window-Shade Rates.

The Interstate Commerce Commission has issued a decision in the case of Alanson S. Page and others against the Delaware, Lackawanna & Western, the New York Central & Hudson River and the Michigan Central, in favor of the complainants. An order having been issued by the Commission in this case on March 23, 1894, requiring these carriers to discontinue their first-class rating of window shades and to cease charging more than third class, and the United States Circuit Court having declined to enforce such order on the sole ground that it applied to shades having very high value as well as to the cheaper varieties, it is held, upon rehearing, that the order of March 23, 1894, should be vacated and a new order entered containing the same general requirement, but with a proviso permitting the defendants to restrict the third-class rates to shades on which the valuation is limited to $6 a dozen, and also permitting the carriers to prevent undervaluation of the more expensive grades of shades by such regulations as they may be advised are just and lawful.

The Joint Traffic Association.

The Board of Control of the Joint Traffic Association met in New York last week and chose E. F. Leonard, of the Toledo, Peoria & Western, as one of the arbitrators of the Association. There was a general discussion of the work and results of the Association thus far, and the Board of Control congratulated the managers upon the success which has attended their efforts, and the justice and wisdom of their decisions upon the many and delicate questions submitted to them. Their policy and acts were approved, and gratification was expressed that they had succeeded in adjusting the relations of the lines to each other upon matters of difference which had appeared irreconcilable, and that in promoting public, reasonable and equal rates to shippers they had rendered valuable service to the public as well as to the railroad companies. The presidents also expressed the opinion that the managers, in the results they had so far achieved, had been the most efficient agent yet discovered for carrying out the spirit and purpose of the Interstate Act. Renewed confidence was expressed in the Association, and a determination to do everything to preserve and continue it.

The various railroads named as defendants in the suit of the Government against the Joint Traffic Association filed their answers in the court at New York last week. They are practically all alike. They allege, in substance, that the Joint Traffic Association is not incorporated, is not a common carrier, and is not engaged in the transportation of freight and passengers, nor in trade. It is admitted that all of the defendant companies are common carriers, either separately or in connection with one another, but it is denied that any of them have been otherwise engaged in interstate commerce, or that they have ever been engaged in any trade in, or in relation to, any article or commodity "within the scope of said agreement."

It is denied in the answer that the joint traffic agreement is in any way unlawful, or that it is intended to restrict honest competition or to establish rates of fare or freight. The joint traffic agreement, it is alleged, does not surrender the control of traffic to the Board of Managers, although the association is advised and believes that it has the legal right so to do. It is the purpose of the association to prevent illegitimate competition and the payments of rebates and commissions which are ruinous to legitimate traffic. It is denied that the Board of Managers is empowered to divide traffic among the roads, only in so far as may be fairly and legally done. The fixing of rates by the Board of Managers is contemplated only so far as to give connecting roads their pro rata share.

It is a further purpose of the association, says the answer, to prevent discrimination and favoritism as between shippers, and to secure such concerted action among the carriers as is necessary to maintain legitimate freight rates. For the benefit of the public, as well as of the railroads, it is asserted to be desirable that weaker roads should be aided, and this purpose, also, the association desires to serve. It is a further purpose not to permit violation of the Interstate Commerce Act.

The answer denies that there is any conspiracy on the part of the association unjustly to augment rates or to hinder free and just competition. The joint traffic agreement, it is stated, was duly filed with the Interstate Commerce Commission. In concluding, the answer declares that the railroad companies parties to the agreement are not, nor is the Joint Traffic Association, subject to the provisions of the act of Congress entitled "An act to protect trade and commerce as against unlawful restraints and monopolies, approved July 2, 1890." This act, it is held, does not relate to the business of common carriers, but solely to so-called trusts, industrial combinations, and attempted monopolies, undertaken by persons or corporations engaged in trade, as manufacturers, miners or dealers in products. The complainant, it is claimed, is not entitled to maintain its suit upon mere general allegations and without specifying what particular statute the joint traffic agreement violates.

Chicago Traffic Matters.

CHICAGO, March 25, 1896.

The Chicago and Ohio River roads seem to be in earnest in their efforts to put mileage books on a legitimate basis. The Pennsylvania has posted notices warning the public against purchasing mileage books from any but authorized agents of the company. The local scalpers are feeling the effect of the tight lines that have been drawn around them, and some of them may be forced out of business. This agreement also provides for a great curtailment of the number of roads over which interchange mileage books are good, but not for the complete abolition of the latter, as has been reported in the newspapers.

The produce merchants of Chicago have sent their threatened notice, alluded to in the *Railroad Gazette* of Feb. 28, that they will divert all traffic possible from any road that makes lower rates from the West to the East around Chicago than are made by the combination of rates via this city. These people object to the Mississippi River as a basing point. A copy of this agreement has been sent to the traffic officers of all Chicago roads. The latter say that the threatened boycott will only have the effect of driving all of this business around Chicago.

Chairman Midgley, of the Western Freight Association, has ruled that secretaries of lumber associations shall not be given free transportation over the roads parties to the Western pass agreement.

The elevator allowance trouble at Chicago and outside junction points has again bobbed up. Several of the eastbound lines are said to have purchased elevators on the installment plan and to be paying for them by increased allowances for transfering grain. With the exception of the elevator trouble eastbound rates from this city continue to be firmly maintained. There is some shading of export grain rates, but this, it is understood, is being done by the steamship companies. Eastbound shipments last week amounted to 81,827 tons, compared with 90,757 for the previous week, and against 57,123 tons for the corresponding week of last year. The different roads carried the following proportions:

Roads.	WEEK TO MARCH 21.		WEEK TO MARCH 14.	
	Tons.	p. c.	Tons.	p. c.
Michigan Central	7,256	8.8	9,338	12.8
Wabash	4,992	6 1	5,716	7.3
Lake Shore & Mich. South.	11,550	14.1	9,818	10.8
Pitts., Ft. Wayne & Chicago	7,989	9.8	7,108	7.8
Pitts. Cin., Chi. & St. Louis.	7,993	9 8	8,279	9.1
Baltimore & Ohio	6,221	7.7	6,439	7.0
Chicago & Grand Trunk	11,384	13.9	14,517	15.0
New York, Chic. & St. Louis	7,422	9.0	7,326	8.0
Erie	13,677	16.7	17,238	17.9
C., C., C. & St. Louis	3,343	4.1	3,978	4.3
Totals	81,827	100.0	90,757	100.0

Of the above shipments 2,057 tons were flour, 52,032 tons grain and mill stuff, 7,164 tons provisions, 8,784 tons dressed beef, 1,506 tons flaxseed, 1,459 tons butter, 1,612 tons hides and 5,109 tons lumber.